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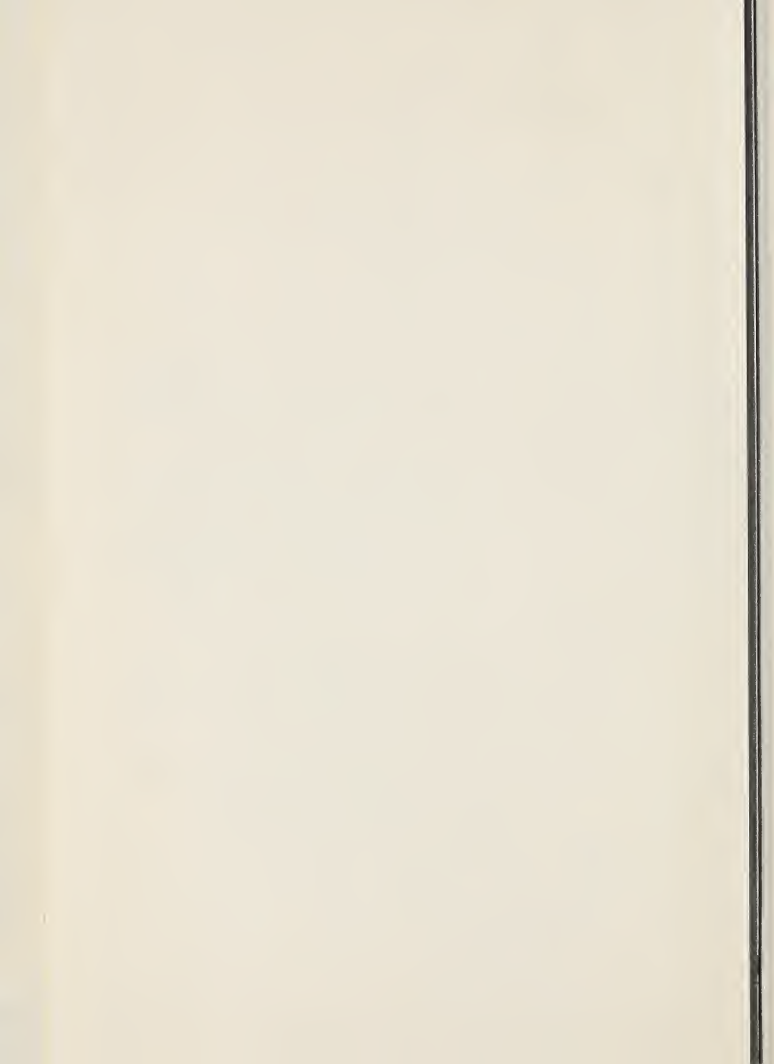


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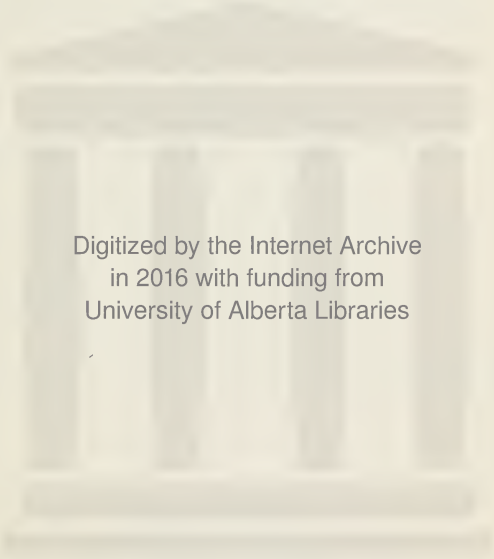
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# Health and Human Welfare

## *A Health Text for Secondary Schools*

*by*

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CHICAGO

NEW YORK

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## PREFACE

The general plan of this book involves: first, (Part I), historical background of the health lessons from the past titled *Health Progress Through the Ages*; second, (Part II), a discussion of certain Special Topics of particular significance to the secondary school student; and finally (Part III) a brief but inclusive Review of Personal Hygiene for a final and individual check-up on the establishment of all desirable health habits.

*Health and Human Welfare* may be used with profit in any of the secondary school grades, since the characteristics of the book lend themselves to ready adaptation. The problems treated are such that their value is readily seen by pupils of high school age.

*Health and Human Welfare* may be used immediately following the use of *Personal and Public Health* (Seventh and Eighth Grades) in the Health-Happiness-Success Series of health texts.

The history of health progress contained in Part I of this book, "Health Progress Through the Ages," is an innovation in a health text. It has long been recognized that the great contribution of history is in its lessons for posterity. History has long been studied for the value of its contribution to social reform particularly in regard to economics and politics, but the health lessons of history have in the main been neglected. That the pages of history are full of significant data for health problems of today is amply borne out by the wealth of material assembled here.

Authority for the inclusion of such material is to be found in the Sixth Yearbook of the Department of Superintendence, which is devoted to "The Development of the

High School Curriculum." On page 473 et seq., will be found the Report of the Committee on Health and Physical Education in Junior and Senior High Schools. On page 474 the report states: "... All of the foregoing factors should be reviewed and emphasized by a section which we might call 'The Relation of Human Welfare to Medical Progress.' This should include discussions of the factors which are the basis of medical progress, such as the use of the microscope, bacteriology, anesthetics, vaccines, antitoxins, and the rapidly developing science of the endocrine glands. The relation of these factors to the reduction of the human death rate should be emphasized. All of this might be capped by some discussion of the romance of modern sanitation . . . ."

A suggested course of study by Drs. Horn and Snedaker is given in the Twenty-second Yearbook of the National Society for the Study of Education. It appears on pages 168 et seq., of Part II, the Social Studies in the Elementary and the Secondary School. Such topics as the following are introduced: The Prevention of Disease, Superstition, Quackery, Care of the Sick, Causes of Disease, Communicable Disease (malaria, yellow fever, tuberculosis, smallpox, typhoid, diphtheria, children's diseases, plagues, and epidemics), Resistance to Disease, Improved Training of Physicians and Nurses, improved Methods, Materials and Equipment in the Treatment of Disease (surgery, anesthesia, antiseptics, and medicines), and Improved Methods of Sanitation.

Under "Health Progress Through the Ages," material meeting these needs will be found. Emphasis is placed only on those *living* things of the past that have a contribution to make to present day healthful living. The Egyptians, the Greeks, the Romans, and the Middle Ages have their vital lessons for us. Not the least of value is the inspira-

on to be derived from a study of the achievements of the great minds and personalities that have devoted their efforts to the physical welfare of mankind. These values have always been in the pages of history, but heretofore no attempt has been made to emphasize the health lessons of history in a complete and well-rounded school text. It is believed that this material will be fascinating to the student, and that it may in many cases be more effective for purposes of retention and health control than the merely physiological approach. The form of the material is non-technical, concrete, and vivid—suitable for making lasting impressions. "Health Progress Through the Ages" offers the opportunity of clinching in permanent form ideals, habits, and standards of healthy living.

Detailed treatment is given to certain aspects of health instruction that are peculiarly within the province of the secondary school. Among these may be mentioned (together with their contributions in terms of the other six of the Cardinal Principles of Secondary Education) "Nutrition and Diet," "Care of the Baby," "Care of the Sick" (*worthy home membership*), "Adolescence" (*ethical character and worthy use of leisure time*), and "Hygiene and Work" (*vocation*).

It should further be noted in this connection that Chapter VIII, Nutrition and Diet, was written especially to cover the needs suggested by the recent revised (1930) edition of Health Education, the Report of the Joint Committee of the National Education Association and the American Medical Association (Part D, "Suggestions for Courses of Study in Health Education in Junior and Senior High Schools," p. 206 et seq.) Several minor additions have been made for the sake of completeness.

The "Care of the Baby" contains much new material in a

somewhat extensive treatment of the topic. It is particularly appropriate for future homemakers and is excellent material for the use of girl students in Home Economics Courses in Junior and Senior High Schools. The type of treatment is developmental both in chapter material and in chapter endings. By "developmental," we mean that type of treatment which is characteristic of the presentation of new material, carefully explained and developed, as contrasted to that brief type of treatment used merely for review and recall of topics and materials previously presented or developed.

The chapter on "The Spring of Life" is an innovation for health texts. It is a topic that requires delicate treatment in a text and yet the theme is one of such vital importance to the secondary school student that it seems strange that it has been ignored for so long. Since this chapter is composed of new material, its type of treatment is developmental both in the body of the chapter and in the chapter endings.

"Hygiene and Work" also contains much new material and is developmental in type of treatment. This topic not only concerns itself with the health of the worker *at work*, but it also deals with the importance of a worthy use of leisure time upon one's efficiency and ultimate success in work. The influence of working conditions on the general health and happiness of the individual is also stressed.

Throughout this book it will be found that a touch of maturity is given to the point of view and the method of treatment of the various topics. Emphasis is placed upon a perspective of intelligent adult life in order that the secondary school student so close to citizenship, may be an asset to the health life of the modern community.

Finally, *Health and Human Welfare* contains a com-



plete resumé and review of all of the essentials of personal hygiene. Such a review is found to be characteristic of hygiene courses in the secondary school.

The developmental type of treatment is to a large extent omitted both in the various chapters of Part III and in the end-of-the-chapter material. Essentially a final review and check on the personal health habits of the individual student, it is, however, complete and comprehensive in that it includes the entire cycle of personal health habits. No topic is omitted.

Particular attention is invited to the nature of the Appendix material and to its actual as well as potential value to student, teacher, and parent.

The authors acknowledge with thanks the assistance of Miss Marie J. Doran, Mrs. Rose D. Moore, and Miss Helen C. Atmore in the preparation of the manuscript.

W. E. B.

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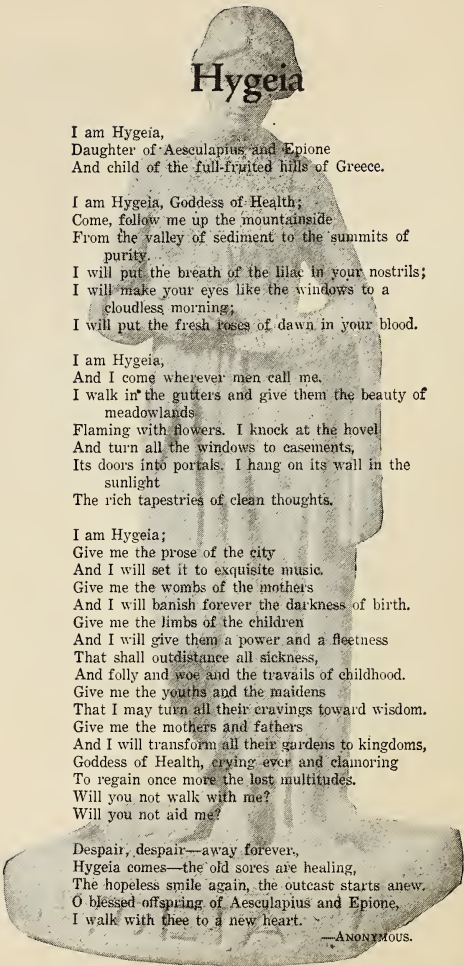
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# Hygeia

I am Hygeia,  
Daughter of Aesculapius and Epione  
And child of the full-fruited hills of Greece.

I am Hygeia, Goddess of Health;  
Come, follow me up the mountainside  
From the valley of sediment to the summits of  
purity.

I will put the breath of the lilac in your nostrils;  
I will make your eyes like the windows to a  
cloudless morning;  
I will put the fresh roses of dawn in your blood.

I am Hygeia,  
And I come wherever men call me.  
I walk in the gutters and give them the beauty of  
meadowlands.

Flaming with flowers. I knock at the hovel  
And turn all the windows to casements,  
Its doors into portals. I hang on its wall in the  
sunlight  
The rich tapestries of clean thoughts.

I am Hygeia;  
Give me the prose of the city  
And I will set it to exquisite music.  
Give me the wombs of the mothers  
And I will banish forever the darkness of birth.  
Give me the limbs of the children  
And I will give them a power and a fleetness  
That shall outdistance all sickness,  
And folly and woe and the travails of childhood.  
Give me the youths and the maidens  
That I may turn all their cravings toward wisdom.  
Give me the mothers and fathers  
And I will transform all their gardens to kingdoms,  
Goddess of Health, crying ever and clamoring  
To regain once more the lost multitudes.  
Will you not walk with me?  
Will you not aid me?

Despair, despair—away forever,  
Hygeia comes—the old sores are healing,  
The hopeless smile again, the outcast starts anew.  
O blessed offspring of Aesculapius and Epione,  
I walk with thee to a new heart.

—ANONYMOUS.

# Health and Human Welfare

## PART ONE

### HEALTH PROGRESS THROUGH THE AGES

#### I. ANCIENT TIMES

##### Primitive Man:

The conquest of disease has been attempted throughout the ages. All peoples have given attention to it. Until recent years, however, the weapons used against disease have been pitifully weak and inadequate and but little progress has been made.

Savage peoples stood helpless before disease as before the lightning from the skies. They usually believed disease to be caused by the entrance of evil spirits into the body and called upon the "medicine man" to cast them out. In performing their duties, these "medicine men" usually dressed themselves in hideous masks and weird costumes. To the accompaniment of shouts and wild, savage music they danced about the patient and sought to cure by driving out the demons and evil spirits.

In primitive society and early civilizations, illness was often thought to be a sign of the displeasure of the gods. Therefore, in time of illness, people turned

to their priests for cure for a double reason—they were supposed to interpret the will of the gods, and they were men of learning above their fellows. The priest was a physician as well. A familiar instance of this is the medicine man of the American Indian. We find his counterpart in most primitive peoples and early civilizations, although in many cases, more refined in form.



### THE MEDICINE MAN

*The medicine man of the American Indian may be taken as representative of a type found in most primitive or savage peoples. He combined the functions of spiritual leader and physical healer. The ancient Greeks were the first to separate the two professions.*

Among savages one of the prime qualifications of a good medicine man was the ability to go into a trance, or a fit, or to “see things” which might have a bearing on the present or future. Close examina-



tion of these types in the light of modern knowledge inclines many authorities to the belief that the medicine man was often one who was subject to epileptic fits. In other cases they were often demented and therefore "touched by the gods." For this reason the insane among primitive people were often looked upon with awe, and were the centers of many superstitious beliefs.

### Sun-Worship:

All of us know of the healthful and curative value placed upon sunlight by modern physicians and scientists. We read and are told constantly of sun-cures, sun-baths, and sun-lamps that produce artificially the various rays of the sun. The theory upon which these treatments is based is known today as heliotherapy, two words which come from the Ancient Greeks, *helio* (sun), and *therapy* (treatment).

The ancients, too, placed great stress upon the importance of the sun as a source of life and health. The sun gave warmth and caused plants and crops to grow. Primitive man in the Stone-Age worshipped the sun as a god, as did his more civilized descendants in Egypt, in Persia, and in Greece. Life, health, and religion were closely associated in the minds of the ancients, and the worship of the sun was generally an important part of their religion.

In Egypt, the sun-god Re (pronounced "rāy") was their greatest god, due, no doubt, to the daily

prominence of the sun in that dry climate. They believed the sun-god Re to be a kind of bird (falcon) that flew across the sky. The wings of this falcon constituted the Egyptian symbol for the sun-god. Their greatest temples were built for the worship of the sun-god.



*Falcon Wings, the Egyptian symbol for their sun-god Re*

## **Methods of the Ancients:**

The ancient Egyptians, Greeks, and Romans carried on the conquest of disease with more science and art than primitive savage tribes. Compared with the present day, however, their knowledge of the body and the causes of disease were meager and inaccurate, and their methods were inadequate to meet the attacks of these unknown enemies.

Because they were looked upon as men of learning, the priests of the temples in all ancient civilizations were asked for advice and assistance in time of trouble and in all the great problems of life and death including illness. In this way they became ministers to man's body as well as to his spirit. Little by little they became physicians as well as priests. Here were the first beginnings of modern

medicine, crude though they were. Even today we may find this close relationship in the missionary fields, where modern religious organizations send doctors and nurses with their missionaries to the less progressive parts of the world.

### **pollo:**

The most famous of the old sun-gods was probably Apollo of the ancient Greeks. The Greeks believed that Apollo drove a blazing chariot across the sky, from sunrise to sunset every day. It is interesting to know that Apollo was their god of health and healing, and was worshipped accordingly in temples built in his honor. The priests of Apollo treated the sick. Sometimes Apollo was known as Phoebus Apollo or Helios (see heliotherapy).

Apollo was the Greek ideal of health and manly perfection; hence a handsome young man is often referred to as an "Apollo." He was, in fact, the god of the athletes of Ancient Greece, to whom they prayed for victory in an approaching contest. The famous Pythian games were held every four years in his honor, and the laurel wreath (sacred to Apollo) was awarded to the winner.

### **Aesculapius (Es-kiu-lā'pi-us):**

While Apollo was the god of health and healing, he was not the god of medicine. The god of medicine was his son, Aesculapius. Whether Aesculapius



### AN APPEAL TO JUPITER

*You have often seen the symbol  $\mathcal{R}_x$  printed on doctor prescriptions. It has been traced back to the ancients who used it as an appeal to Jupiter when writing their remedies for the sick. The modern physician, however, does not depend on magic or superstition, but on the results of scientific investigation.*

originally was a real person or merely legendary we are not sure. He is supposed to have lived about 1,200 years before Christ, but it was not until 430 A.D. that he was made the god of medicine in a public ceremony at Athens.

He was such a famous healer and cured so many people that Pluto, the god in charge of the underworld (where the dead people were supposed to go) is said to have complained to his brother, Jupiter, who was the ruler of all the other gods. Jupiter slew Aesculapius with a thunder-bolt to oblige Pluto in order that more people might die.



### AESCULAPIUS

*The Greek god of medicine, also famous as "the first physician." He was the father of Hygeia and Panacea who helped him with his patients. Notice the serpent and the staff (the caduceus) which are to this day symbolic of the medical arts. See page 8.*

Temples were erected in honor of Aesculapius, and at these temples the sick were treated by the priests of Aesculapius. Very often the priests instructed students in the practice of medicine in these temples. It is for this reason that Greek physicians became famous throughout the ancient world, and for this reason also modern medicine is regarded as having had its origin in the ancient Greek medicine. Frequently Apollo and Aesculapius were worshipped together in the same temple, and the priests were known as the priests of Apollo and Aesculapius.



They treated the sick not only at the temple, but frequently in their homes when the patients were seriously ill. We have here, very clearly, the beginning of the modern physician.

### **Hygeia (Hy-gee'a) and Panacea (Păn-ă-cē'a):**

Hygeia and Panacea were daughters of Aesculapius. They were supposed to assist their father Aesculapius, in his work of healing the sick. Hygeia has given her name to the science of Hygiene, the science of the preservation and improvement of health. She was regarded as the goddess of health. Her name survives today in various forms: hygienic, hygienic, and hygienist. One of the monthly magazines published by The American Medical Association (the great organization of American doctors) is called *Hygeia*. It is regarded as a very reliable and interesting health magazine.

The name of Panacea is not so well known as that of her more famous sister Hygeia, yet it still exists in the form of the modern word "panacea" meaning a "cure-all," or a remedy or medicine that is supposed to cure all diseases, or in some cases, all diseases of the same type" (intestinal tract, respiratory system, etc.)

### **Symbols of Medicine:**

The serpent has represented knowledge and health and healing power from the earliest times. There



### HEALTH SYMBOLS

*In this decorative panel chosen for a school of medicine everything has a meaning related to health. The head is that of Hygeia, goddess of health; the serpents (and staff) are the symbols of Aesculapius, the god of medicine; the wreath of laurel branches is sacred to Apollo, the god of health and physical perfection; the horns of plenty indicate prosperity and abundance so necessary to physical welfare.*

evidence of the cunning, if not the wisdom, of the serpent in the Garden of Eden. Later Moses put a serpent of brass on a pole (Numbers 21:9) "and it came to pass that if a serpent had bitten any man, when he beheld the serpent of brass he lived." Many of the gods of the ancients, particularly those that had to do with health were represented as being attended by serpents. It was believed that the serpent had the power of purifying himself by shedding his skin.

A rod or staff has also been connected with the



*The caduceus is used generally as the emblem of the medical profession. A form of it is used as the symbol of the Medical Corps of the United States Army, and is used generally as the emblem of the medical profession. It may be traced back to Aesculapius and Apollo.*

idea of health in some mysterious way. The staff and club perhaps indicated a weapon of defense against disease. "Thy rod and thy staff, they comfort me," sang the psalmist.

The Greeks associated both rods and serpents with their gods of health and medicine, Apollo and Aesculapius. The symbol of Apollo was a staff (presumably of laurel, sacred to him) with two serpents entwined about it. It was, and still is, known as the caduceus.\* Sometimes it is shown surmounted with wings, denoting speed, and sometimes also with ribbons, indicating plenty. It has long been used as a sign of the medical profession. The Medical Corps of the armies of both the United States and of Gre-

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\*Pronounced că-du'ce-us. This symbol was attributed to Mercury by the Romans.



tain use it as the emblem of their branch of the military service.

It is said that one day while Aesculapius was treating a patient in his tent, a serpent entered and coiled itself about his staff thus endowing him with great wisdom. Every statue of Aesculapius shows him with his staff and serpent. The staff is a knotted one, perhaps symbolic of the "knotty" or difficult problems of the physician.

Hygeia, the daughter of Aesculapius, is also frequently represented with a serpent, sometimes feeding it from a cup, presumably containing milk. Some people believe this to mean that the serpent could imbibe wisdom from the cup of Aesculapius, while others believe that it is intended to show that Hygeia is feeding to her pet serpent the only perfect food—milk.

### **Hippocrates (Hip-poc'ra-tēs):**

The golden age of Greece which was at its height some three or four hundred years before the Christian era, was marked by the construction of magnificent temples and the production of marvelous works of art. Socrates, Plato, and Aristotle were learned men of this period who hold high rank among thinkers of all times. The conquest of disease also was advanced during this age by Hippocrates, the "Father of Medicine."

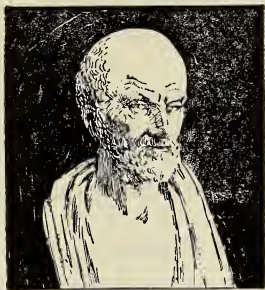
Hippocrates was the most famous of the early Greek physicians. He lived in the Fifth Century

B. C., and was born about thirty years before Plato. His teachings are still known, and to some extent are similar to those of modern medicine. He believed in a careful study of the patient and advised fresh air, good diet, massage, and other forms of treatment that would assist nature in effecting a cure. Some of the principles of treatment that he set forth were not fully developed until within the last century, in comparatively recent times.

Hippocrates is also famous for his high ideals and for the nobility of his professional character. Students who completed the course of medicine taught in the Temples of Aesculapius were required to take an oath or pledge to use their knowledge only for good, never for evil, purposes. He did this as a means of protecting the welfare of the sick and of maintaining the good reputation of the physician. This pledge has become known as the Oath of Hippocrates, and has been for many years a model for medical students to study. It may be regarded as an expression of the high ideals of the medical profession.

### **The Oath of Hippocrates:**

Today, after almost 2500 years have passed, the same oath or pledge—known as the Hippocratic Oath—is required, in only slightly modified form, by nearly all medical schools of their students just before they graduate. Your own physician has pro-



### HIPPOCRATES

*Greek physician and "the father of medicine"*

ably taken this Oath. Ask him. Parts of it are so fine that they are quoted here.

The *ancient* form was, in part, as follows:

"I swear by Apollo, the physician, and Aesculapius and Hygeia and Panacea and all the gods and all the goddesses . . . . so far as power and discernment shall be mine, that I will carry out regimen for the benefit of the sick and will keep them from harm and from wrong. . . ."

"To none will I give a deadly drug even if solicited, nor offer counsel to such an end. . . ."

"But in purity and in holiness will I keep my life and my art. . . ."

"Into whatsoever house I shall enter, I will go for the benefit of the sick, holding aloof from all voluntary wrong and corruption. . . ."

"Whatsoever in my practice or not in my practice

I shall see or hear amid the lives of men, I will not divulge, as reckoning that all such things should be kept secret."

The high ideals expressed in the Hippocratic Oath, to which the doctors of today subscribe, may well give us confidence in the profession to which we turn in the hour of sickness and need.

### **The Medicine of the Greeks:**

The Greeks were organizers of learning and culture in many fields. It is to their genius for collecting, organizing, and using knowledge in the field of medicine that we are indebted for the beginning of medicine as a science. While originally the care of the sick was closely connected with religious worship, the treatments of the priests of Apollo and Aesculapius gradually became more and more practical as their knowledge increased.

The Temples of Aesculapius were not only schools of medicine for students, but they also afforded facilities for the treatment of the sick very much after the order of our hospitals and sanatoriums of today. Of course they were not as scientific or as highly organized as ours, but the beginnings were there. The remedies used for the cure of the sick were mostly fresh air, proper food, sunlight, exercise, and rest. Occasionally the priests used drugs, oils, or other aids. Frequently, they treated the sick in their own homes, especially when their condition was too serious

ous to permit their removal to the temple. The value of massage was not unknown. It was commonly used by the athletes in their training at the palaestra (gymnasium); so, too, was the sun-bath. In spite of a certain amount of religious superstition, the ailing received excellent and comparatively enlightened care in those days, and the knowledge and ability of the Greek physicians was acknowledged throughout the ancient world. As time passed, the religious or superstitious treatment of disease disappeared, and the physicians became a separate class from the priests. The Greek physicians continued to develop their skill, and their fame and good repute extended to all parts of the ancient world. The reputation of the Greek knowledge of medicine was so great that a Persian King once sent to Greece for a physician. While the microscope, chemistry, and other aids to medicine were unknown to the Greek physicians, yet they made great progress. They rejected the theories of earlier days that disease or illness was caused by demons or the gods, and sought natural causes. To discover the cause of disease, they believed in a careful study of the patient; and to help him, they tried to find a course of treatment that would assist nature to cure the disease or ailment. In such respects they were much in advance of the superstitious beliefs that prevailed in most of Europe during the early Middle Ages, during which



time the teachings of the Greek physicians to a great extent had been forgotten. In many ways their methods of treatment were similar to modern practice.

### **Knowledge of the Human Body:**

Much of what modern surgeons and physicians know about the structure and functions of the human body has been learned from a study of human bodies by operation or by dissection after death. To this necessary practice we owe much of the progress and skill of modern medicine. This progress did not begin until ancient prejudice and superstition against dissection had passed away, and doctors and surgeons were free to pursue their investigations.

The Greeks, like other ancient peoples, knew little about the treatment of the sick by surgery or the use of instruments. This was because nearly all of the ancient religions (especially the Egyptian and the Greek) forbade interference with the bodies of the dead. Consequently they were able to obtain little information about what went on in the body.

There was some surgery of a rough or simple sort for the treatment of external hurts and injuries such as boils or abscesses, treatment of wounds from battle, and the extraction of teeth. In general practice they could not perform serious operations, because nothing was known of the circulation of the blood in those days and also because there was no knowledge of modern anesthetics.

### Galen (Gālēn):

There was a famous Greek physician named Galen who lived during the second century. He wrote many works on medicine. Based on a somewhat imperfect knowledge of the human body, he made recommendations for systematic treatment of various diseases that were accepted for the next fourteen or fifteen hundred years.

What Galen knew about the human body he learned mostly from dissecting and studying the bodies of animals. He assumed that the bodies and organs of animals were like those of human beings. In this he was both right and wrong. There is, of course, a strong resemblance between the structure, organs, and functions of the bodies of human beings and those of animals, but there are some differences of which Galen was not aware. This meager and faulty knowledge of the human body was perhaps Galen's greatest contribution to medical progress and human welfare, and was considered very important until recent times. His works were the basis of medical thought and practice for hundreds of years.

### The Great Contribution of the Greeks:

We must not forget another great contribution of the Greeks to human welfare. They have given to the world ideals of physical perfection for us to strive to attain. The physical development of the Greeks as



A GREEK ATHLETE

*"The Discus Thrower" is an example of one of the contributions of the Greeks to health and complete living—an ideal of physical development. It is one of the characteristics of Greek art.*

portrayed by their sculptors has been the marvel and admiration of the world. They achieved this physical perfection because of their love of beauty, and because of their willingness to train themselves for their ideals. Physical exercise was a part of the daily education and training of the Greek youth. Training grounds and places were furnished at public expense for the physical development of Greek citizens. Stress was placed upon athletic competition in their games and festivals. The winner at the



Pythian games or at the Olympian games won honor for a lifetime.

Nor did the Greek crave physical achievement alone. He was equally interested in his mental development. Our respect for the achievements of the Greek philosophers, poets, mathematicians, dramatists, musicians, writers, and artists ranks as high as that for the physical perfection of their athletes. In the Olympian games competition was afforded along literary and artistic lines as well as athletic. What a marvelous example the Greeks have set for the world in spiritual as well as physical achievement and in the development of a well-rounded personality! This ideal may well be regarded as the great contribution of the Greeks to health and human welfare.

### **The Romans:**

The Romans were a superstitious race. This particularly applied to matters of health. They depended for their well-being on many different gods, each of whom had to do with some particular phase of health. Instead of a system of medicine like the Greeks, they had a system of superstitious and religious observances. It has been said that they not only had a god or a goddess for every disease but that they had one for each stage of a disease, even the common "itch!"

Having no medicine and no physicians, this was,

perhaps, the only thing they could do. It must be remembered that the Romans were never a cultured people as were the Greeks, who collected and organized knowledge. As the years passed, Greek physicians came to Rome just as other influences of Greek culture came to Rome and to other countries of the day. At first they were treated with suspicion and opposition, but their methods and results were so superior that the Romans finally accepted them and they became a necessary part of Roman life. Even the Roman emperors consulted them or had them as their personal physicians. Galen, the famous Greek physician, occupied such a post of honor in Rome for many years, and through it, achieved much of his fame.

### PRACTICAL APPLICATIONS

#### For Effective Study:

1. Describe briefly:
  - (a) the medicine man of primitive tribes
  - (b) the priests of the ancient temples
  - (c) the first real physician among the Greeks.
2. Be prepared to quote some expression from the Hippocratic Oath that you feel should be singled out for its high ethical significance.
3. Who was:
  - (a) "the first physician?"
  - (b) Hygeia?
  - (c) the god of health of the Greeks?
  - (d) "the father of medicine?"
4. What is the caduceus?

**or Discussion:**

1. Compare the medicine man of primitive tribes with the physician of today.
2. By whom was the healing of the sick carried on among the ancient civilizations?
3. Compare the attitudes of the Greeks and the Romans toward questions of health.
4. Briefly compare Hippocrates and Galen.

**or Health Habit Formation:**

1. Compile a list of the health habits suggested by the reading of the material in the chapter.
2. What health practices by the ancient Greeks (at the time of Hippocrates) are recognized health habits today?

## II. THE MIDDLE AGES

### **Decline of Civilization:**

All high school students are aware of the fact that with the fall of Rome, Europe fell into a decline of civilization that lasted for about one thousand years. For this reason the period is often referred to as The Dark Ages, symbolizing the lack of learning and the ignorance of the people. Roughly speaking this era lasted from about 500 A.D. (the fall of Rome) until about 1500 A. D. (the discovery of America).

During this time the high type of civilization of the ancient world was largely forgotten. With the other forms of knowledge, Greek medicine, both its theory and its practice, disappeared from common use. The books and the learning of the ancients were felt to be dangerous because they came from "pagan" or "heathen" sources. It is important to note, however, that while not used, they were at least preserved in many places. Toward the end of the Middle Ages a revival of learning occurred called the Renaissance, and the ancient books were brought out from secret places and their contents used to contribute to the development of the people. In medicine the healing methods of the ancients were studied again and used for the welfare of man.

During the Dark Ages man cared but little about

s body. He devoted the most of his thought and attention to his soul. He did not realize that by taking proper care of his body, he might also be serving his soul. Life on this earth was felt to be only short and temporary existence, and that life hereafter was the only worth-while goal. In fact, man in his ignorance was loth to treat his ills or diseases by any other than spiritual means, as he thought it might be interfering with the will of God. People were very superstitious about their ills, as were the early Romans, the early Greeks, and barbarous and savage tribes. These beliefs were not so much the result of their religion as they were the products of general ignorance and lack of education on the part of the people. In this atmosphere of ignorance and superstition, the practical treatment of disease made no progress and much that had been known to the Greek physicians was forgotten.

### **Lack of Sanitation:**

One of the features of the Middle Ages was the increase in both size and number of cities. These cities were the beginnings of modern cities as we know them. Large numbers of people began to live close together. With few exceptions there was no provision for the disposal of either human waste or garbage. Modern sanitary conveniences as we know them did not exist. There were no sewers, very often no toilets, or out-houses. Nothing was known

of modern methods of preventing disease, or of the protection of food, water, or milk supply. It is said that the stench or odor of large cities was noticeable miles away. Such conditions of filth were the breeding-grounds of disease and when a contagious disease started, it spread very rapidly. The people were practically helpless without protection or means of treatment. The wealthy people during such times often retired to their country homes or estates, but this was generally without avail since the disease could easily be carried to them. The epidemics were then thought to be expressions of God's displeasure and were often referred to as "plagues." The spread in waves over all of Europe and caused the death of millions of people.

### Hospitals of the Middle Ages:

In many places during the Middle Ages, institutions for the treatment of the sick and the relief of the suffering were established. Since nothing was known of the causes of disease nor of modern methods of treatment, these places were generally very unsanitary. The rooms were like large halls, dark and without ventilation. Many beds were crowded into these spaces, and in some instances, patients lay on filthy straw on the floor. It was a common practice to put a number of people, old or young who were suffering from different diseases into the same bed. Thus a child with only a slight ailment





### HOSPITALS OF THE MIDDLE AGES

*Frequently four to six people were crowded into the beds of the hospitals, even in the late Middle Ages, regardless of sex, age, or disease. Poor patients were forced to lie on straw in the hallways. (From a wood-cut of the 16th Century).*

might be placed in a bed beside an old man or woman with a very serious or repulsive disease. The food was unwholesome. Candy and sweets were regarded as a proper delicacy for deserving patients. Flies and vermin were everywhere. Compare this with modern treatment in the home or hospital of today, and you will then realize the debt we owe to scientific medicine.



*A KNIGHT HOSPITALLER*

### **The Knights of Malta:**

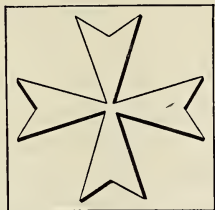
Some exceptions to the unsanitary methods of the Middle Ages were probably to be found in the institutions of certain orders. One of these organizations was the Knights of Malta, or The Knights Hospitallers\* of St. John the Baptist. This order lasted from the days of the Crusades until modern times.

Originally they were composed of Knights who dedicated themselves to a double purpose—the recovery of the tomb of Christ, or The Holy Sepulchre as it was called, and the care of the sick. The membership was composed of knights recruited from the foremost nobility of all of the Christian nations of western Europe—Spain, France, Italy, England and Germany. When Jerusalem was recovered by

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\*Pronounced Hös'pī-täl-ler.





### THE MALTESE CROSS

*made famous as the symbol of the Knights of Malta. What is it reminiscent of today?*

The Christians, the Knights Hospitallers established here a hospital for the care of the sick among the pilgrims. Later, when the Turks recaptured Jerusalem, they permitted the Knights Hospitallers to keep their hospital for one year, or until the sick recovered. The organization then founded a new home on the island of Rhodes. Here again the Turk attacked, and they again lost their home. This time they moved to the island of Malta, where they resisted many attacks on the part of the Turk. For many years the Knights Hospitallers were the foremost Christian outpost against the expansion of the Turks in the Mediterranean. Since that day until the present time Malta has been a great strategic point in the Mediterranean from a military or naval point of view. Eventually, the Knights Hospitallers became known by the name of their final home, the Knights of Malta. The Maltese cross, taken from the Crusaders "cross," represents the first associ-

ation of the cross as a symbol with the idea of the relief of suffering or first aid. The Red Cross today is a descendant of this idea.

Wherever the Knights Hospitallers made the home, they built a splendid hospital for the relief of the sick and needy. They not only gave the afflicted excellent care, but records also seem to show that the Knights were most progressive in trying new methods for their cure. It is related that many Knights who died in the hospitals gave their own bodies for dissection, in order to advance medical knowledge. Schools of anatomy were maintained somewhat similar to our medical colleges of today. They also had excellent libraries, dealing with medical and surgical topics. They used mosquito netting over the beds of their hospital patients, and in many other ways were leaders in medical practice for several centuries. Thus the Knights of Malta furnish us with a good example of one of the exceptions to the generally bad sanitary conditions of the Middle Ages. It is probable that there were other similar instances, but they were not typical of the age.

### **Lack of Protection Against Contagion:**

During the Middle Ages Europe was swept by great waves of disease. Practically nothing was known of the causes of these diseases. People with their great fear and ignorance depended upon a



### THE GREAT WARD

*Hospital of the Knights of Malta*

sorts of peculiar ideas for cures. It is difficult for us to realize how bad conditions were. During the 14th Century the "plague" or "black death" caused the death of one-quarter of the people of Europe, a total of perhaps 25,000,000 deaths. At its height in Constantinople, five to ten thousand people died each day. One hundred thousand people died of it in the city of Florence alone.

The ancients, the Egyptians, the Greeks, and the Romans, also suffered from great epidemics of contagious diseases, smallpox, typhoid fever, and "plague." Today such epidemics are practically unknown in most parts of the civilized world. The

great change has been brought about by the preventive power of modern medicine. Glimpses of the terrible effects of disease in the past are shown to you in order that you may realize what the discoveries of science and medicine have done for mankind.

Some writers have suggested that the fall of Rome was due to the undermining of the health and vigor of the Romans by disease. They are known to have suffered for three hundred years from malaria before the barbarians overcame them. Malaria in itself is not a deadly disease in the sense that it causes death rapidly or in great numbers. It is seldom fatal, but is usually long drawn out. It is also very weakening and takes away both physical and mental energy. The plague and other diseases had also visited them many times, so that they probably lacked the physical strength and numbers to overcome their enemies.

### **The Black Death:**

The bubonic plague or "black death" is really a disease of rats that is transmitted to the human blood stream by bacteria from the bite of an infected flea which leaves the rat when it dies. The ancients and the people of the Middle Ages did not know that. They guessed at many causes: punishment by God for their sins, great changes in the universe, bad air, poisoned wells, or dogs. When the

great plague reached London in 1665, the stray dogs were killed to stop the spread of the disease, but the guilty rats and fleas went unsuspected and unpunished. The next year a great fire swept London, and the plague ended. The "guilty" or infected rats had been burned, but the people did not at that time realize that it was the fire that had saved them.

You will read about the plague or the "black death" in history and literature. It is impossible to read stories of life in those days without learning about it. It came in two great waves, one about 600 A.D. and the other just before 1350 A.D. It was probably present in many places but in a minor degree both before and after these dates. In London, it did not reach its height until the year 1665. At its worst, people died so fast and in such great numbers that the streets of the cities are said to have been filled with the dead and dying. There was no time for funerals. The bodies were hauled away by cart-loads and buried in huge trenches or thrown into the sea. Whole families were wiped out; in many instances no heirs were left to claim estates. The visits of the "black death" have become landmarks in history.

The bubonic plague is still found in the Far East. It is largely controlled by seeking for infected rats through laboratory analysis, by quarantine, by extermination of rats in infected areas, and by im-





### THE BLACK DEATH IN LONDON

*The plague was thought to be spread by dogs. One man is killing dogs, another is carting them away. The fire were for the purpose of "purifying the air." Crosses were marked on the doors of houses where people were sick with the plague, and men stationed there to prevent any from leaving. (From an old poster.)*

provement in sanitation and housing regulations. Other parts of the world carefully watch vessels coming from places where the plague is known to exist. When these vessels come into port, devices are placed on the hausers that are tied to the dock to prevent rats from landing. Thus the bubonic plague is kept in check. Again the great preventive power of medicine is emphasized. No cure for the plague is known; our safety lies in preventive measures.

### Other Contagious Diseases:

Leprosy has been a dread disease since ancient times. It is spoken of in the Bible. Its effects are very repulsive; parts of the body, hands, feet, arms and legs, dry up and waste away. Most people do not realize how prevalent this disease was during the Middle Ages. It was one of the first of the great diseases or pestilences to come under man's control. It was discovered late in the Middle Ages that if one kept away from lepers, the disease could not be transmitted. Therefore, lepers had to leave home and live together at certain places designated for their care. When forced to leave their families and friends to go to these places, the lepers were thenceforth regarded as dead. Such places for lepers were called "lazarettoes." At one time there were almost 10,000 of these lazarettoes in Western Europe alone. Gradually the disease died out because the isolation of the lepers prevented other people from catching the disease.

Smallpox was also one of the dread diseases of the Middle Ages. It spared the rich and the nobility no less than the plague. Kings and queens died of it, or else lived with faces badly disfigured by pockmarks. Many of the famous characters of history are described as having these marks on their faces. Today very few people in civilized countries show signs of having had this dreaded disease.

Diphtheria and typhoid fever together with

many other diseases which have since largely disappeared helped to make life miserable and short. Three hundred years ago, the average person might have been expected to live twenty years. Today the expectancy of a normal life is close to sixty years in civilized countries. What has caused this great change? It is the conquest of disease and the improvement in living conditions brought about by modern medicine and science.

We still have influenza epidemics. They are new. Generally they start somewhere in Asia, and sweep around the world. The worst one of recent years was the one of 1918, during and at the close of the World War. People still remember how terrible it was, but even this was mild compared with the great epidemics of the Middle Ages.

### Quarantine:

The word "quarantine" came from two Italian words "quaranta" and "giorni," meaning forty days. After the plague in 1348, the government of the city of Venice decided to detain all vessels and strangers that might be suspected of carrying the plague for forty days before admitting them to the city. If the disease developed, they were not admitted. Although people in those days did not understand how disease was transmitted, they could not help but notice that quarantine or detention of the suspected or sick tended to prevent the spread



the disease. This practice was adopted by people in other parts of Europe. Crosses were painted on the houses of those who were sick with the plague, and those that dwelt there were forbidden to leave the house. Nations as well as cities adopted it to help keep out dangerous contagious diseases.

Today, quarantine of sick or suspected cases is much stricter than it was in those early days, and is one of our most powerful preventive measures against the spread of contagious diseases. Why did the Venetians pick "forty" as the number of days of detention and observation? It is supposed to be based on the Bible. Moses and Christ each spent forty days alone in the wilderness.

The period of forty days for quarantine has been reduced in modern times. Now all great ports have stations to quarantine their suspicious cases. Medical officers board every vessel entering port, and make a careful examination of every one. Suspicious cases of contagious diseases are not allowed to land; they are isolated and placed under observation in quarantine." In England the old period of forty days is still maintained for the quarantine of dogs. As a consequence, it is said that "rabies" does not exist in England. In the United States, we may well be thankful for the rigid health regulations enforced at ports of entry. The health officers of the government guard the health of the whole country.

**PRACTICAL APPLICATIONS****For Effective Study:**

1. Who were the Knights Hospitallers?
2. What was "the plague" (black death)?
3. What was responsible for the great disease epidemic of the Middle Ages?
4. Tell of the origin of the word "quarantine."

**For Discussion:**

1. Compare the hospital service of the Middle Ages with that of today. What differences can you note?
2. Compare the average expectancy of life in the Middle Ages with that of today.
3. How does "quarantine" as applied today, assist in preventing disease epidemics?
4. Why were the people of the Middle Ages unable to stop the disease epidemics or great "plagues" that swept across the continents?

**For Health Habit Formation:**

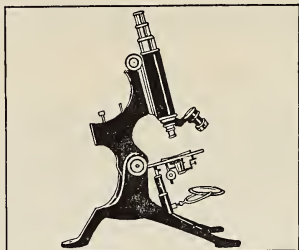
1. What desirable health habits are suggested by the material contained in this chapter? Make a list.

### III. THE CONQUEST OF DISEASE

#### Discovery of the Microscope:

An important landmark in the conquest of disease is marked by the invention of the microscope, in 1590, by two Dutch lens-grinders, Hans and Zachias Janssen. The microscope consists of an arrangement of glass lenses which makes things seem larger than they really are. Its improvement about a hundred years later by another Dutch lens-grinder named Leeuwenhoek (pronounced Lāy-ven-hōök) led to the discovery of a world of tiny forms of life that cannot be seen without it. The microscope has been improved greatly since its invention and is capable of even greater improvement. One cannot help but wonder if the conquest of disease will be advanced as much further by the discoveries of the microscope of the future, as it has already been advanced by the microscope of the present day.

Leeuwenhoek was born in 1632 and lived to be over ninety years of age. While only a comparatively uneducated man, he developed a hobby of grinding lenses for magnifying small objects. He kept at this hobby until he had made for himself the best microscope that had ever been made. With an unending curiosity he examined everything imaginable. One day he turned his powerful microscope on a few drops of stagnant water; in it he saw



### THE MICROSCOPE

*The first microscopes revealed a new world. The modern microscope has been one of the chief weapons of science in the war against disease.*

many living things—small animals and tiny plants—that had never been revealed to the eye of man before. Thus Leeuwenhoek was the discoverer of this new world, the world of the microbes.

He searched for, and found, microbes everywhere. He even examined scrapings from his teeth and found microbes there. But he found none there after he had been drinking hot coffee! Later, he discovered that heat, such as boiling water, seemed to destroy microbes. Leeuwenhoek made a careful record of his observations in a notebook, like any carefully trained student of science. His discoveries made him known throughout Europe among the learned people of his day. Many corresponded with him, or came to look at the wonders under the lens of his microscope. His discoveries paved the way for others in the development of modern medical science.



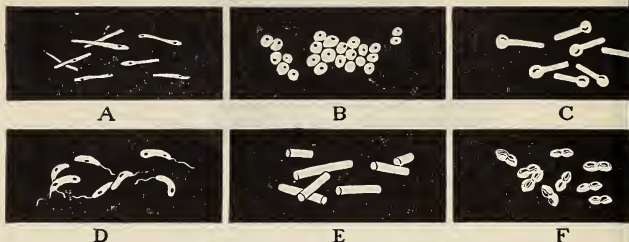
LEEUVENHOEK

*He, too, discovered a new world—that of the microbes*

There were, however, many things about microbes that even the great curiosity of Leeuwenhoek did not uncover.

### **Germs or Microbes:**

“Microbe” means a tiny living thing. “Germ” is another name for the same thing. Germs, or microbes, that grow as plants are called bacteria, and animal forms are called protozoa. They live by the millions in air, water, and soil. They blow around in the dust of the air, and float in the waters of rivers and streams. Many of them grow or multiply very rapidly, and they are carried from place to place on many things. Each germ is a single cell. As a living organism it can grow, and after it reaches a certain size, reproduces itself by dividing into two cells. These again grow and reproduce by



### FORMS OF BACTERIA (*S. BACTERIUM*)

A.—*Bacilli* (*s. bacillus*) of *tuberculosis*. B.—*Cocci* (*s. coccus*) or *spherical bacteria*. C.—*Bacilli* of *tetanus* (showing enlarged spore at end). D.—*The bacillus of cholera*. E.—*Bacilli of anthrax*. F.—*Cocci of pneumonia*.

division. Sometimes three generations may thus grown in an hour. It was Spallanzani, an Italian born in 1729, who first discovered the method which microbes reproduce themselves. He also made further investigations regarding the effect of heat on germs. Until this time people had believed that microbes "just happened" under certain circumstances, a theory known as spontaneous generation. Spallanzani did much to overcome this false theory. This was later demonstrated to the world by Louis Pasteur, a great French scientist, in a series of experiments. We know today that all life springs from other life of its own kind.

Most microbes are of the plant type, or bacteria. Of these there are three great classes: (1) the spherical called *cocci*, from the Greek word meaning



g "berry"; (2) the rod shape called *bacilli*, from the Latin word meaning "rod"; and (3) the spiral shape called *spirilla*, from the Greek word meaning "coil." Some microbes have the power to develop "spores" which enable them to preserve their vitality under adverse circumstances for a long period of time. Bacteria may be helpful or harmful. Among the helpful ones are those responsible for the processes of fermentation which causes bread to rise, cider to change to vinegar, milk to sour, and cheese to "ripen." Bacteria also cause decay in the forms of vegetable and animal matter. Harmful bacteria known as disease germs are among man's worst enemies. For this uncovering of the real nature and function of bacteria, we must acknowledge our thanks to Louis Pasteur, one of the greatest benefactors of mankind in the whole history of science.

### **Louis Pasteur (1822-1895):**

For some two hundred years after the invention of the microscope, scientists observed many different forms of microscopic life. Numerous explanations were offered and wild guesses were made concerning them. Debates and controversies arose and were bitterly contested by the learned men. It remained, however, for Louis Pasteur to point out the true nature, purpose, and effects of these tiny forms of life.



LOUIS PASTEUR (*Student*)

*It is estimated that his discoveries and those of his followers have added twenty years or more of life to hundreds of millions of people, mostly to young people and children. He has saved more lives than the greatest conquerors ever took.*

Pasteur's work covered a wide range of interests. His discoveries were so revolutionary and so contrary to the ideas that had been formerly accepted that he met with violent opposition at almost every step. He persisted, however, until he proved that tiny micro-organisms are the causes of helpful processes such as "fermentation" and of harmful conditions such as "disease." He went still further and showed methods of preventing ill effects of some of the harmful ones. The results of Pasteur's discoveries broke through the great cloud of darkness and ignorance that had obscured the causes of disease for untold centuries. His work marks the beginning of scientific preventive measures in the



quest of disease. Because of their scientific value, the steps in many of his investigations are given here in some detail.

### **Pasteur's First Discoveries:**

Pasteur's discoveries were extended over a long and busy lifetime. Each completed task seemed to open a path to some greater service to mankind, and lead the way to its successful solution.

Louis Pasteur was born in France in 1822. He was educated for the teaching profession and taught physics and chemistry for many years. A large part of the time outside his classes was spent in his beloved laboratory. He often continued experiments far into the night without regard for rest or meals.

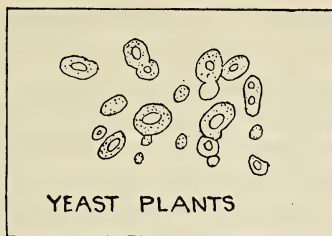
*Early Studies of "Crystals":* During his student years, Pasteur became strongly attracted to the study of "crystals." The crystals of "tartaric acid" that form in the manufacture of wine especially interested him because of some unexplained conditions that were connected with them. He continued these studies after he became an instructor in the Normal School. Before many years he succeeded in finding the proper explanation for the strange behavior of these crystals and won recognition as a brilliant scientist at an early age.

*Discovering the Cause of "Fermentation":* Pasteur's studies of the crystals connected with wine

brought him into close contact with the process "fermentation." People had known for a long time that the addition of sugar to the juices of beets, grapes, and some other substances resulted in their "fermentation" and production of alcohol and carbonic acid gas. It was also known that yeast promoted fermentation. The reasons for the changes, however, were unknown.

A few years before Pasteur's discoveries in fermentation, yeast had been studied under a microscope and found to consist of tiny rounded living bodies that grew and multiplied. The belief existed that when the yeast cells died, their decomposition set up the process of fermentation in the substance which contained them. Pasteur experimented with many kinds of ferments and finally demonstrated to the world for the first time that fermentation was a process concerned with the *life* and *growth* of the tiny yeast plants and not their death. It showed that as the yeast cells grew they used the sugar for food and caused the formation of the alcohol and carbonic acid gas as products of their activity.

This explanation of fermentation was so different from the commonly accepted one that there was strong opposition to its acceptance. One of his leading opponents asked why they should consider yeast so important to fermentation when there were many fermentations taking place without it, and



*Pasteur discovered that fermentation was a process that concerned the life and growth of yeast plants*

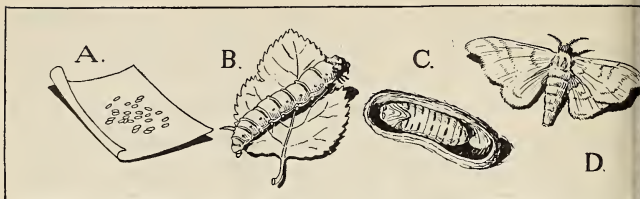
suggested the fermentation of milk as an example of one of them. Pasteur found that when milk curdled, there were little gray patches on the sides and bottom of the vessel. Under the microscope these patches were found to consist of tiny globules, much smaller than those of yeast. He took some of these globules from the milk and placed them in another liquid. Soon the same kind of fermentation was taking place in the new liquid that had occurred in the milk. By such experiments he silenced his opponents and advanced the knowledge of this subject by pointing out that each kind of fermentation has its own particular ferment.

*Forms of Microscopic Life Found in the Dust of the Air:* Pasteur sought to find the source of these tiny forms of life that could be seen when water and other substances were observed under the microscope. He rejected the commonly accepted explanation that these tiny forms of life appeared

“spontaneously” or created themselves without a parent cause. His experiments led him to suspect their presence in the dust of the air. To prove his theory, he prepared several jars or flasks of broth, sterilized them by boiling, and sealed them up. The broth in flasks that were opened in places where there was dust in the air soon spoiled or “putrified” from the growth of germs that got into it from the air. To get away from dust in the air, Pasteur carried twenty sealed and sterilized flasks out to a glacier high up in the Alps Mountains. Of the twenty flasks that were opened, only one showed an alteration or change in the broth after the air had been admitted. These experiments disproved the theory that germs form spontaneously or create themselves, and enabled him to proclaim to the world that dusts in the air distribute them from place to place.

*Discovery of Germs as Causes of Disease:* Pasteur’s scientific mind now turned toward other possible effects of the germs he had discovered in atmospheric dusts. He had proved germs to be the cause of fermentation, putrefaction, or the spoiling of substances, and decomposition, or decay. He wondered whether they might not be a cause of diseases as well. Two separate opportunities to experiment with this idea came almost at once, one with diseases of wines and the other with diseases of silkworms.

Wine manufacture has long been an important business in France. Sometimes the wines turned bitter, sour, or acid, which rendered them worthless. In 1864 wine-growers in the little village of Juvignac, in the South of France, were suffering from these conditions, and they invited Pasteur to come for their assistance. He studied the spoiled wines under his microscope and found tiny bodies in them that were different from the yeast cells that promoted normal fermentation. He concluded rightly that these bodies got into the fermenting liquid from the air and caused the "diseased" wines. He experimented with many methods of relieving and preventing these conditions. He persevered until he finally discovered that the simple process of heating the wine to a certain temperature and keeping it at that temperature for a few minutes would kill the germs that caused it to spoil, but would not affect the flavor or appearance of the wine. In the solution of this problem we have the birth of the process of "Pasteurization." "Pasteurization" of milk is used by dairies everywhere to kill disease germs. In this process, the milk is heated to a temperature of from 145° to 150° F. and is held at that temperature for twenty to thirty minutes. This kills all disease germs, but does not spoil the flavor of the milk or kill the harmless germs of fermentation that are so essential to the manufacture of other dairy products from the milk.



*Stages in the life of a silkworm: A.—Eggs. B.—Worm. C.—Chrysalis. D.—Moth*

France has been an important silk-producing country for many years. About the middle of the nineteenth century, a mysterious disease attacked the silkworms. It spread to other silk producing countries; it threatened to ruin the industry and caused enormous money losses. In 1865, Louis Pasteur was persuaded to give up his studies in fermentation for a while and come to the assistance of the silk producers.

Silkworms pass through an interesting "life cycle" which includes several stages of growth. From the eggs are hatched caterpillar-like worms. These worms feed upon the mulberry leaves and later spin a silken house or "cocoon" around themselves. It is the threads of this cocoon that are unwound to produce the silk of commerce. If nothing is permitted to interfere, however, with the regular life cycle, the worm changes into a butterfly-like moth inside the cocoon. At the proper time, the cocoon breaks open, the moth flies out and lays eggs for



new generation of silkworms, starting a new life upon its way. Thus the four stages of growth successively the egg, the worm, the cocoon, and the moth.

Pasteur examined diseased worms, moths, and eggs under his microscope and found tiny oval bodies in them. These germs proved to be the cause of the disease. He found that the disease could be passed on from a diseased moth to its eggs. He learned also that the disease was "contagious" because healthy worms could "catch" it by contact with diseased ones. He continued his studies for several years until he devised a method of checking the disease. This method began with the examination, under a microscope, of the tissue of the moths after the eggs were laid. If the parent moth had any of the tiny, oval bodies or germs in it, both the moth and its eggs were burned. If no germs were found, the eggs were saved and hatched. Thus by a process of selecting and hatching only healthy eggs, this disease was conquered and prosperity returned to the silk-producing districts of the world. These discoveries of Pasteur, made in connection with his efforts to help the wine merchants and silk-producers of France, mark one of the turning points in the conquest of disease. He showed conclusively that microscopic germ life is a cause of disease as well as responsible for other processes, such as fermentation, putrefaction, and decay.

## PRACTICAL APPLICATIONS

**For Effective Study:**

1. When was the microscope discovered, and by whom?
2. Name some of the discoveries of Leeuwenhoek that were significant for health progress of later centuries.
3. Distinguish between the two kinds of germs, microb.
4. Name the three types of bacteria.
5. What causes "fermentation"?
6. How did Pasteur prove that microbes existed in dust of the air?
7. Was Pasteur a physician? What was the date of birth and of his death? When was he making greatest discoveries (approximate dates)?

**For Discussion:**

1. Of what importance was the discovery of the microscope in the conquest of disease?
2. Make a special report on the life of Louis Pasteur. Discuss some of the difficulties that he had to overcome.
3. Discuss the value of bacteria, and also their possibilities for harm.
4. What were the results of Pasteur's discoveries in the wine and silk producing industries?

**For Health Habit Formation:**

1. What health habits were suggested to your mind on a reading of this chapter. Please write them down.

## IV. RESISTANCE TO DISEASE

### The Body Defends Itself Against Disease:

The conditions of warmth, moisture, and darkness inside the body are favorable to the growth of disease germs. Fortunately for us, the body has a number of ways of resisting germ attacks. This resistance, or "immunity to disease," as it is often called, varies greatly with individuals. It may be strong or weak, temporary or permanent, natural or acquired.

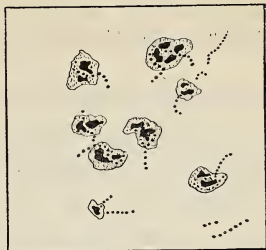
### Entrances" of the Body:

Most germs gain an entrance to the body through the mouth and nose. Standing guard at these ports of entry are the moist secretions of the *mucous membranes* which line them. Many germs that are caught in on particles of dust never get by these surfaces. They are trapped by the moisture and are killed by its mild "germicidal" or "germ-killing" power.

Some germs that find their way into the digestive tract are killed by the germicidal action of the *digestive juices*. Especially destructive to germs is the "hydrochloric acid" that forms one of the active "principles" of the gastric juice in the stomach.

### NATURAL IMMUNITY

The growth of germs is resisted by substances



### NATURAL DEFENDERS

*The large bodies (gray and black) are white corpuscles. They are destroying cocci, forms of bacteria, which are represented above as dots arranged in the form of "chains." The white corpuscles destroy the cocci by assimilating the*

normally found in the blood. These include white corpuscles, "antibodies," and "antitoxins." If the resistance is strong, the germs are usually overcome and the person is "immune" to the disease. If resistance is weak, the disease gets a start and develops.

### The White Corpuscles of the Blood Destroy Germs

The white corpuscles of the blood are important natural defenders against disease germs that gain an entrance to the body. They seek out and attack the germs wherever they are found, passing through the walls of the blood vessels into the tissues, if necessary. The white corpuscles destroy germs by surrounding or wrapping themselves about the germs and digesting and absorbing the

to their own substance. They often unite in groups and attack and absorb a number of germs at a time. In the course of the battle some of the white corpuscles are killed by the germs. A large part of the pus, or matter that forms and collects in and around infected cuts or sores, is made up of the bodies of white corpuscles that have been overcome by their efforts to defeat the germs. Proper habits of living are the best means of insuring a plentiful supply of white corpuscles in the blood stream.

### **"Antibodies" in the Blood:**

Under normal conditions the blood resists the attacks of disease germs by the presence in it of substances called "antibodies." These antibodies have been found to help us in a number of ways. Laboratory experiments have determined that they prepare germs in some way for an easier attack by white corpuscles. They also seem to provide a substance which makes it difficult or impossible for the germs to grow. As long as these substances are present, the growth of the germs is held in check and they remain harmlessly inactive. When these substances are deficient, the opposition to germ growth is so slight that the germs often multiply very rapidly. In other cases, the antibodies are directly responsible for killing off dangerous disease germs that have gained an entrance to the body. The manner in which the body defends

itself against disease germs is very complex and not thoroughly understood. Constant experimentation is gradually clearing up many of the mysteries which have been connected with this phase of the conquest of disease. The results of these experiments often point out ways by which we can strengthen these natural defenses of the body.

### **Antitoxins in the Blood:**

When germs start to grow, they produce poison or "toxins" which are circulated about the body in the blood stream. Just as soon as the toxins appear the body begins the manufacture of "antitoxins." These have the power of neutralizing or checking the poisoning effects of the toxins. It has been found that antitoxins are "specific" in their action; that is, an antitoxin is only effective against the toxin of a particular disease. "Antibodies," however, are more "general" in their action. They are valuable in holding many different kinds of disease germs in check. A great advance was made in the conquest of disease when it was discovered that the supply of antitoxins in the blood could be artificially increased.

### **ACQUIRED IMMUNITY TO DISEASE**

Among the important discoveries of medical science in recent times is the fact that people can build up an acquired or artificial immunity against



me diseases. This is done by the use of specially prepared substances called vaccines, antitoxins, and serums.

It had been observed many years ago that persons who once had certain diseases were immune from a second attack of them. Valuable use of this observation was made in conquering smallpox and developing the practice of vaccination against it.

### **the Scourge of Smallpox:**

Before vaccination was discovered, smallpox was one of the terrible scourges of the world. It traveled rapidly from person to person, attacking the rich as well as the poor. Kings and princes were as liable to it as their humblest servants. The death rate was high, and those who recovered were usually disfigured for life by the pits or "pockmarks" that are the characteristic after-effects of this disease. Smallpox is believed to have originated in Asia, spread from there to Europe, and carried to America in the ships of the early explorers and settlers. Terrible epidemics often occurred. It is estimated that 60,000,000 people in Europe died from smallpox in the eighteenth century.

### **Discovery of Smallpox Vaccination:**

The credit for conquering smallpox belongs to an English physician, Dr. Edward Jenner. It had been noticed that dairymaids sometimes contracted



DR. EDWARD JENNER

*He discovered that vaccination with cowpox vaccine was effective in preventing smallpox. It was Pasteur who later revealed the principle involved.*

from cows a disease that had a close resemblance to smallpox. This disease, "cowpox," as it was called, was much milder than smallpox. Persons who had suffered from cowpox, were safe from the attacks of the much more terrible smallpox. For a number of years, Dr. Jenner gathered all the information he could about these two diseases, and finally in 1796, he performed his first experiment in "vaccination." In order to do this, he took some "matter" from a cowpox sore on a dairymaid's arm and introduced it into scratches he made in the arm of an eight-year-old boy. Sores developed on the boy's arm and healed with scars much like the "vaccination marks" on our own arms today. After waiting for two months, Dr. Jenner inoculated the

7 with virulent "matter" taken directly from a smallpox patient. The "vaccination" successfully protected the little fellow from the dreaded disease. A little later, Dr. Jenner again inoculated the same boy with smallpox virus, but without effect. Vaccination against smallpox was proved a success. In a short time the idea of vaccination spread over Europe and crossed the ocean to America. The first to use vaccination against smallpox in the United States was Dr. Waterhouse of Boston. In 1800, Dr. Waterhouse vaccinated his little five-year-old son and other members of his family. They resisted smallpox, although cases of it were developing in their community all the time. President Jefferson had his family vaccinated in 1801. This gave a great impetus to the spread of vaccination in the United States.

Dr. Jenner received high honors from the nations of the world for his wonderful discovery. A very interesting expression of gratitude came to him from the American Indians. Along with their gifts, they sent the following message: "Brother! Our Father has delivered to us the book you sent to instruct us how to use the discovery which the Great Spirit made to you whereby the smallpox, the fatal enemy of our tribe, may be driven from the earth. We have deposited your book in the hands of a man of skill whom our Great Father employs to attend us when sick or wounded. We shall not

fail to teach our children to speak the name of Jenner and to thank the Great Spirit for bestowing upon him so much wisdom and so much benevolence. We send with this a belt and string of wampum in token of our acceptance of your precious gift and we beseech the Great Spirit to take care of you in this world, and in the land of spirits."

### **How Vaccination Develops Immunity to Smallpox**

The vaccine that is used against smallpox today is obtained from calves. The cowpox, to which these animals are subject, is much less dangerous than smallpox. The relationship between these two diseases is such, however, that when "vaccine," or cowpox virus, is introduced into our body, it stimulates the production of substances that successfully resist the virus of the much more dreaded smallpox. The acquired immunity to smallpox obtained in this way does not necessarily last for a lifetime. The protection is believed by many to last for about a period of seven years. If a number of years have passed since vaccination, it should be renewed whenever there is any danger of contracting the disease.

### **Everyone Should Be Vaccinated:**

Wherever the use of vaccination against smallpox is widely used, the disease seldom occurs. When the United States took possession of the Philippine

lands at the close of the Spanish-American War, there were usually about 40,000 deaths per year from smallpox. Protective measures were begun at once. Over a million persons were vaccinated and the disease was practically eliminated. As the years went by, however, people grew careless about vaccination. By 1918 there were so many unvaccinated persons on the Islands that a severe epidemic took place. It was estimated that 250,000 cases developed and 50,000 deaths occurred before it was checked. Since this epidemic, vaccination has been rigidly enforced, and smallpox is practically unknown. It is interesting to note that there were over 5,000 vaccinated American soldiers in the Philippine Islands during this epidemic and but one case of smallpox occurred among them, although it raged all around.

There have been a great many cases of smallpox in the United States within recent years. In the registration area, there was, for the five-year period ending 1928, an average of 41,500 cases of smallpox each year. Since smallpox can be almost entirely prevented by vaccination, this represents over 200,000 cases of a loathsome disease, due entirely to carelessness or ignorance. The case rate for smallpox in the United States is higher than in most any other country of advanced civilization. Medical science has supplied the means of prevention. People must be educated to use it. Smallpox



is often so rare in communities that people fail to recognize its great danger and do not take precautionary measures unless compelled to do so by law.

Vaccination is compulsory in many places. In the United States, there is no federal law which compels it, but many States require vaccination before admitting children to school.

Vaccination is neither painful nor dangerous. The scratch of a needle is all that is needed to introduce the vaccine into the body. Great care is taken in producing the vaccine so that there is but a little danger of any subsequent infection, if the proper precautions regarding cleanliness are taken at the time of the vaccination and during the healing period.

### **Louis Pasteur Discovers the Principle of Vaccination:**

In an earlier chapter, we learned of great advances in medical science that followed Pasteur's discovery of germs as a cause of disease. Pasteur put this discovery to immediate use in showing to wine-growers and silk-producers of France how to protect themselves against the germ diseases that rapidly were destroying these industries. He continued his benefactions to mankind by discovering the principle of vaccination.

Vaccination against smallpox had been discovered by Dr. Jenner in 1798. It consisted in inoculating



ing a person with the milder "cowpox" in order to protect against a later development of the much more dreadful "smallpox." The practice of vaccination against smallpox spread over the world and was very effective in preventing it. Just *how* "cowpox" protected against "smallpox" remained a mystery until Pasteur discovered certain general principles that governed the power of germs to cause disease.

### Discovery of Chicken-Cholera Vaccine:

Pasteur's discovery that germs were a cause of disease stimulated a great interest in these tiny, microscopic forms of life. On one occasion, a scientist discovered the germ that caused "chicken cholera." He sent Pasteur the head of a rooster that had died of the disease and a description of his findings. Chicken cholera is a disease that spreads very rapidly among chickens, often killing one-tenth of the whole flock in a very short time. Pasteur experimented with these newly-found germs, trying to grow them in different kinds of cultures." He found that the germs were so powerful that the smallest drop of a freshly made culture on a crumb of bread was sufficient to kill a chicken. One day, by chance, he inoculated some hens with a culture that he had prepared some weeks before and had forgotten. Greatly to his astonishment the hens became ill and then recov-

ered. He then inoculated these same hens with some fresh, powerful, "virulent" germs and they resisted the attacks of the disease. He followed this remarkable discovery by testing upon other hens the effects of cultures that had been allowed to stand different numbers of days. He found that a fresh culture was so powerful that it would kill eight or nine out of every ten hens. A culture a little older killed only five out of ten hens and one still older caused the death of only one out of ten fowls. If the culture was allowed to get stronger enough, no hens died at all from the inoculation and they acquired an immunity against inoculations of fresh, virulent germs.

The immunity acquired by fowls that are vaccinated against chicken cholera and by persons who are vaccinated against smallpox is due to this fundamental principle of vaccination that Pasteur discovered: that by overcoming disease germs in a weakened state, the body is stimulated to manufacture substances in the blood which protect successfully against later, more virulent attacks. Pasteur weakened the germs of chicken cholera by allowing them to stand for a few weeks. Smallpox germs become weakened in the bodies of cattle. Cowpox is really the form in which smallpox shows itself in the cow. The cow resists smallpox vigorously that the germs become weakened in the struggle for existence. It is these weakened germs

to cause our body to prepare successful defenses against later attacks of smallpox.

### **Pasteur Discovers Anthrax Vaccine:**

While experimenting with chicken cholera, Pasteur was studying a disease called anthrax. Anthrax was as terrible a scourge among sheep and few other animals as smallpox had been among human beings before it was conquered. Anthrax occasionally attacked human beings and had a high death rate wherever it was found. It spread rapidly among animals, and there were certain fields where sheep could not be grazed without catching the disease. These so-called "cursed fields" were later found to be places where the germs of anthrax lived in the ground for long periods of time after the diseased animals had died.

Pasteur sought to find a method of weakening the power or virulence of anthrax germs just as he had done with those of chicken cholera. He soon realized that merely allowing the cultures to become stale would not be sufficient for this. The germs of anthrax had been found to be virulent after being buried for eight, ten, or even twelve years in the graves of animals that had died from the disease. He experimented with method after method until he discovered that the cultures must be heated to a certain temperature before allowing them to become stale. When this was done, the weakened

germs of anthrax stimulated the bodies of sheep to build up a resistance which prevented them from developing the disease at any future time.

When Pasteur announced his method of vaccinating against anthrax, there were many people who doubted its value. In order to prove the truth of his discoveries, he conducted an experiment that is famous as it was spectacular and dramatic.

The Agricultural Society of the City of Marseilles provided Pasteur with a number of sheep. Twenty-five were to be vaccinated with two doses of weakened anthrax germs, given twelve days apart. A few days later these twenty-five vaccinated sheep and twenty-five others were to be inoculated with very powerful and virulent anthrax germs. Pasteur predicted that the twenty-five vaccinated ones would survive. On May 5, 1881, a group of farmers, physicians, newspaper reporters, and others gathered at the farm. Twenty-five sheep were given the first injection of the vaccine. Twelve days later, a second injection was given. On May 31st all the vaccinated and unvaccinated sheep were inoculated with fresh, powerful, virulent anthrax germs. In view of the fact that anthrax progresses very rapidly, all the interested parties were invited to return ten days later on June 2nd. On the appointed day, Pasteur arrived at the farm, he was greeted with great applause by those who had arrived before him.



### ONE OF PASTEUR'S TRIUMPHS

*By his famous experiment on sheep, he proved even to skeptics that vaccination could be used to prevent anthrax.*

Inside the pen, twenty-two unvaccinated sheep were already dead and two others were breathing their last. Not one of the vaccinated sheep was ill. The last one of the unvaccinated sheep died that same night. As the days went by and no anthrax developed among the vaccinated sheep, Pasteur's prophecy was fulfilled, and his experiment pronounced a complete success. For these discoveries, Pasteur received high honors from France and other countries. Vaccination against anthrax became widely used, and great sums of money were given to farmers and stock-raisers all over the world.

### **Pasteur Conquers Rabies or Hydrophobia:**

The crowning achievement of Pasteur's life was



the conquering of the terrible disease called rabies or hydrophobia, a word which comes from the Greek, meaning fear of water. Rabies is transmitted to animals and human beings by the bite of mad dogs and wolves. The disease is very slow in developing. Several weeks or even months often elapse before it makes its appearance. The death rate from rabies is very high, death being accompanied by terrible suffering.

Records which show the existence of rabies go back into ancient times. Ancient Greek writers described it and suggested many ineffective remedies. In some places it was even believed that the disease could be transmitted by mere contact with the saliva or even the breath of persons suffering from it. This belief resulted in many needless cruelties being practiced upon the unfortunate victims, for they were sometimes shot like wild animals, or poisoned, strangled, or suffocated.

Pasteur became especially interested in rabies or hydrophobia in 1880, just a year before he triumphed over the deadly anthrax in sheep. He had much more difficulty in finding a suitable way to weaken the virus of this disease than with the others he had conquered. He obtained an important clue when he found that it could be transmitted from one animal to another by inoculations of nervous tissue from the brain or spinal cord of an animal suffering from it. After years of exper-



tation he found that this disease-laden nervous tissue lost its power or virulence after it was dried and allowed to stand for about two weeks. In order to vaccinate or protect dogs against rabies, Pasteur first inoculated them with some of this fourteen-day-old harmless nervous tissue. He followed this the next day by injecting some that was fifteen days old, then with some twelve days old, and finally he used some that was taken fresh from a diseased animal. When these vaccinated dogs were bitten by rabid dogs, the immunity they acquired from the vaccination successfully protected them against the disease.

Pasteur continued to demonstrate the value of protective treatment with animals, but hesitated to attempt it with human beings. He feared that the treatment might cause the disease. It was not long, however, before an opportunity presented itself. A nine-year-old boy, named Joseph Meister, was attacked on the way to school by a mad dog. The dog had knocked the little fellow down and had bitten him many times before it was driven away. Joseph's mother brought him to Pasteur for treatment. Upon the advice of friends Pasteur consented. He first injected some of the harmless fourteen-day-old spinal tissue of a rabid animal. Day by day, Joseph played happily among the rooms of Pasteur's laboratory. Each day the inoculations became more virulent until finally the

time came for the twelfth and final injection fresh, extremely dangerous virus. So powerful this fresh virus that it always caused the development of rabies in unvaccinated rabbits in the space of seven days. Pasteur was much more worried about the treatment than little Joseph Meister. He became so anxious that he could not work. He dreamed many times that the little fellow would die. A letter written by Madame Pasteur at this time gives us an interesting picture of his state of mind. She wrote: "My dear children, your father has had another bad night; he is dreading the inoculations on the child. And yet there can be no drawing back now! The boy continues in perfect health." There was no drawing back. The inoculation was given and all of Pasteur's fears proved groundless. Little Joseph Meister remained in perfect health.

Another case was soon brought to Pasteur for treatment. A fourteen-year-old shepherd boy named Jupille had bravely protected several smaller companions from a mad dog that had attacked them. Jupille overcame the dog and killed him, but was severely bitten in the struggle. Six days after the attack Pasteur began his treatments. They proved wholly successful in spite of the fact that almost a week had elapsed before they were commenced.

The news that a remedy had at last been found for rabies, soon spread to all parts of the world.



### JUPILLE

*is statue at the Pasteur Institute in Paris shows the  
teen-year-old shepherd boy who, in protecting several  
her companions, was severely bitten by a mad dog. He  
killed the dog, and Pasteur's treatments saved him from  
rabies, or hydrophobia.*

People began to flock to Paris for the protective  
treatments. Funds were collected and the world-  
famous Pasteur Institute was erected. Pasteur  
was greatly touched when little Joseph Meister sent  
a contribution toward it. Up to 1912 over 30,000  
cases of hydrophobia had been treated with very  
unsuccessful results. Since then additional  
thousands of cases have been treated with similar  
success.

The first Americans to receive this treatment were four little boys who were bitten by a mad dog while at play. This was in 1885, a month so only after Pasteur had saved the life of Joseph Meister. Paris was 3,000 miles away and it took twelve days to get there at that time. Pasteur was consulted by cable and he directed that they be sent to him at once. They boarded the first ship to Europe and, when the ship docked at Havre, were rushed to Pasteur's laboratory in Paris. They received the gradually increased injections for ten successive days. Not one of them ever developed the disease, and in due time they returned safely to America.

Since Pasteur's time the protective treatment for rabies has been perfected but it is essentially the same in principle as when he discovered it. Vaccines are available almost everywhere and should be used whenever there is any likelihood that rabies might develop.

Pasteur died in 1895 at the age of 73. He received the highest honors from the nations of the world during his life, and as the years go by he is increasingly revered as one of the world's greatest benefactors.

### **War, Science, and Humanity:**

Years before his death, at the dedication of the Pasteur Institute in Paris, Louis Pasteur spoke of

ed on the place of war in modern civilized society. The words of this great humanitarian are well worth our careful thought. He said:

Two opposing laws seem to me now in contest. The one, a law of blood and death, opening out in day new modes of destruction, forces nations to be always ready for the battle. The other a law of peace, work, and health, whose only aim is to deliver man from the calamities which beset him. The one seeks violent conquests, the other the relief of mankind. The one places a single life above all victories, the other sacrifices hundreds of thousands of lives to the ambition of a single individual. The law of which we are the instruments lives even through the carnage to cure the wounds inflicted by the law of war. Treatment by our antiseptic methods may preserve the lives of thousands of soldiers. Which of these two laws will prevail, God only knows. But of this we may be sure, that science, in obeying the law of humanity, will always labour to enlarge the frontiers of life."

### Summary of Pasteur's Work:

Pasteur, remember, was not a physician. He was a chemist. He did not attempt to treat or cure diseases. His efforts were entirely in the prevention of disease. But modern medicine is based upon the scientific discoveries of Pasteur; not medicine alone, but great industries as well depend upon

these discoveries. Pasteur has been called an explorer in a new world—the world of germ life.

By reason of Pasteur's discovery, that the germs which cause decomposition can be killed by heat, two great improvements were made possible in the world's food supply.

- (1) The process of Pasteurization made our milk supply safe from disease germs.

- (2) The great industry of canning and preserving foods was made possible, by using heat to kill the germs that caused food to spoil.

Joseph Lister applied Pasteur's discoveries to the care of wounds, and as a result, antiseptic treatment was introduced into modern surgery—a science which has saved perhaps millions of lives.

The prevention of disease through inoculation was another of Pasteur's discoveries. The discovery of the germ as a cause of disease, and the means of counteracting it led to additional discoveries by others. Today there are few contagious diseases for which there is no inoculation or serum. Again, millions of lives have been saved.

Because of the discovery of the nature of disease we have our modern systems of sanitation and quarantine for the prevention of it. How much sickness has been prevented by this procedure and how many lives saved, it is impossible to estimate.

Perhaps the highest tribute to the greatness of Pasteur is the fact that, a few years ago, the French





### A MEMORIAL TO PASTEUR

On the opposite side of the shaft is a bronze plate with the following inscription:

**LOUIS PASTEUR**

1822-1895

*Benefactor of Industries, Revealer of Mysteries of Disease of Man and Animals, and Deviser of Methods for Its Control, Whose Discoveries Have Lessened Suffering and Prolonged Life and Added Immeasurably to the Comfort, Security and Dominion of Man.*

people voted him the greatest Frenchman who ever lived—greater than any of their famous kings, greater than their heroes, and warriors, and generals, greater than Napoleon, greater than the poets, novelists, and philosophers. It may well be said that Louis Pasteur has done more for human welfare than any man who ever lived.

He lies buried in the crypt of the Pasteur Institute and no man ever had a greater monument. His own words are carved on his tomb as his epitaph:

“Happy is he who possesses within himself a god, an ideal of beauty, an ideal of science, an ideal of patriotism, *and who obeys it*—an ideal of all the virtues of the Gospel.”

### **Robert Koch (1843-1910):**

Dr. Koch, a great German scientist and contemporary of Pasteur, made many discoveries relating to the discovery or isolation of disease germs. Before Pasteur had turned his attention to anthrax Koch had already made studies of the bacteria of anthrax. It was Pasteur who, as a result of his studies and experiments, proved to the world that these germs did cause the disease anthrax, and also showed how sheep might be protected from the disease by means of vaccination.

Koch devoted a very busy life to tracking down



### DR. ROBERT KOCH

A great pioneer in bacteriology. He first isolated the germs of anthrax, tuberculosis, Asiatic cholera, bubonic plague, malaria, and sleeping sickness.

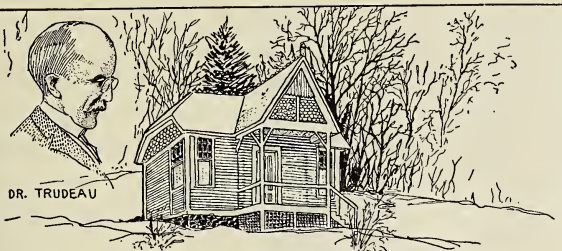
He discovered the causes of various other diseases. He was a pioneer in new methods of bacteriological work and one of his discoveries stand out among the great scientific achievements of our time. His discoveries revealed the nature of some of the worst enemies that man has had among the diseases. In 1878 he discovered ("isolated") the bacillus of tuberculosis, and in 1883 that of Asiatic cholera which, until recent times, was a "plague" disease. Later, he identified the germs causing bubonic plague (the "black death"), malaria, and sleeping sickness. With the isolation of these germs, it became possible to guard intelligently against these diseases, and to combat them by scientific means. While an effective antitoxin for the treatment of

tuberculosis has never been discovered, the isolation of the germ enabled medical men all over the world to perform experiments in the treatment of the disease. One of these men was Dr. Trudeau at his sanatorium at Saranac Lake. By reason of these experiments it has been possible to determine which methods of treatment were most beneficial.

Although Dr. Koch made his first discoveries in a humble country doctor, he rose to be one of the greatest scientists of his day. In recognition of his services Dr. Koch was eventually made Director of the Institute of Berlin, a famous medical institution somewhat similar to the Pasteur Institute in Paris. He ranks with Pasteur as one of the great benefactors of human kind.

### **Tuberculosis and Dr. Trudeau:**

Born in New York in 1848, Dr. Edward Trudeau was, in his young manhood, afflicted with tuberculosis in one lung. He went to the mountains and lived as much as possible out-of-doors in the fresh air and sunshine, ate good wholesome food and rested as much as possible. He recovered, in spite of the fact that people believed tuberculosis to be incurable. He bought a house and lived at Saranac Lake in the Adirondack Mountains for the rest of his life. Other doctors sent tubercular patients to him, and eventually he established a sanatorium there for the treatment of the disease.



DR. TRUDEAU

THE LITTLE RED COTTAGE - THE FIRST OF THE SANATORIUM - 1885

The ADMINISTRATION  
BUILDING AT THE TIME  
OF DR. TRUDEAU'S DEATH  
IN 1915 -

### DR. TRUDEAU AND HIS SANATORIUM

Because of his sympathy and understanding, Dr. Trudeau was known as "the beloved physician."

One of the most important factors in the treatment of this disease is early diagnosis. Dr. Trudeau believed that if the symptoms were recognized early, tuberculosis could be halted if not cured by rest, good food, fresh air, and sunshine.

### Other Diseases:

Since Pasteur pointed out the way, other diseases have been brought under control by the use of vac-

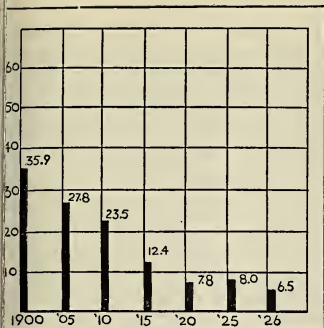
cines. It has been found that dead, sterilized germs of some diseases stimulated the production of protective substances. Pasteur had obtained these effects by the use of weakened, living germs.

One of the most successful and widely used vaccines is that used in protecting against typhoid fever. Typhoid fever is a germ disease frequently spread by impure water. The dead, sterile typhoid germs in the vaccine cause the body to develop protective substances which successfully resist the attacks of active, living germs. This immunity lasts only for a few years however, and the vaccination should be repeated whenever necessary.

Vaccination or inoculation against typhoid fever is increasing as more people realize its value. Soldiers and sailors are all vaccinated against it, and typhoid fever among them is rare. The diagram on page 79 shows some striking results of the use of modern preventive methods against this disease. A sensible time to obtain this protection is just before starting on a vacation, in order to prevent infection from drinking water or milk that may contain the germs of this disease.

Some people who are not sick with the disease themselves often carry the germs of a disease about with them within their own bodies, and unknowingly transmit the disease to others. Such people are known as "carriers." All typhoid germs come from the bodily waste from the intestines of those





*The falling typhoid death rate in the United States registration area.*

who are either ill with the disease or from “carriers.” One of the most common methods whereby carriers spread typhoid germs is by handling food without having carefully washed their hands. Others eat the food and contract the disease. Flies often carry typhoid germs from excreta to food.

• Other vaccines are successfully used to protect against plague and cholera. Note the difference in meaning between protection, or *prevention*, and *treatment*.

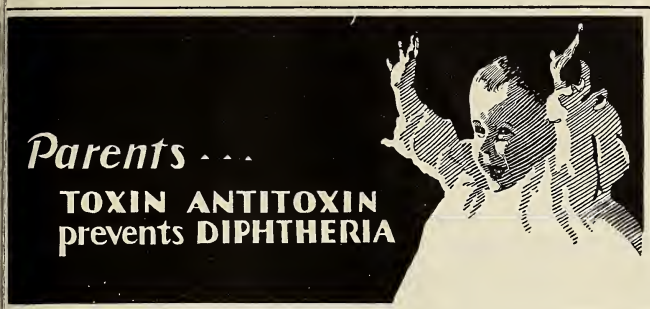
### **Antitoxins Develop Resistance to Disease:**

When germs start to grow, they produce “toxins” or poisons which are circulated about the body in the blood. The body produces “antitoxins” to neutralize or check the effects of the toxins. It has been

found that powerful antitoxins of some disease can be produced in the bodies of animals and later transferred into our own bodies in time of need. Antitoxins are used with success in combating diphtheria, tetanus or lockjaw, scarlet fever, and meningitis. Other diseases are still being studied.

The antitoxin of diphtheria is produced in the body of a horse. A very small amount of diphtheria toxin is injected into its body at first. These injections are repeated at weekly intervals, and as the antitoxins develop, the strength of the injections is increased. At certain times some of the blood of the horse is collected. This is allowed to stand until the serum has separated from the solid portions of the blood. The serum contains the antitoxins. It is then treated and sterilized, tested for its strength, and carefully sealed in containers especially prepared for the purpose. Before the discovery of diphtheria antitoxin, this disease caused a much larger number of deaths each year than it causes today. The use of antitoxin at the start of the disease is wonderfully effective in preventing the serious results that make diphtheria one of the greatly dreaded diseases. This use of antitoxin is for the treatment of diphtheria.

When artificially produced, antitoxin was tried as a preventive of diphtheria and it was found that its protection lasted but a month or so. It was then discovered that by adding a little toxin to



### A PRIZE-WINNING POSTER

*This prize-winning poster was designed by Allen Hermes, a student of the Lafayette High School, Buffalo, N. Y., in a poster competition during the 1930 New York State Diphtheria Prevention Campaign. (Courtesy of New York State Committee on Tuberculosis and Public Health.)*

the antitoxin, a much longer period of protection can be obtained, possibly for the balance of one's lifetime. The use of diphtheria "toxin-antitoxin," as it is called, is generally effective for the prevention of diphtheria, and its use is being encouraged in many places. Physicians, schools, public health authorities, and child welfare organizations are encouraging the immunization of children against this dangerous disease. Three injections, a week apart, is the procedure of the treatment. After about six months have passed, a test can be applied to determine whether the person is immune or

not. This "Schick Test," as it is called, can be applied before the injections of the toxin-antitoxin to determine whether they are needed or not, or it can be used after the injections to find out whether they have produced the desired effect. The test consists of injecting a few drops of toxin under the outer skin. A competent physician can then read the reaction that occurs and decide whether injections of the toxin-antitoxin are needed.

### Distinctions in Use of Terms:

Confusion exists in the minds of many in the proper use of the terms "vaccine" and "serum." A vaccine is an artificial preparation containing either weakened or killed germs of disease. When the vaccine is introduced into the body, the presence of these dead or weakened germs causes the body to *produce its own antibodies* to overcome the effects of their presence. This is called *active immunization*, the body producing its own antibodies.

A serum is produced by giving the vaccine to an animal—a horse, a cow, or a calf. The animal then produces in its blood the antibodies necessary to combat the presence of the germs. The watery part of the blood of the animal, called serum, contains these antibodies. This serum and the antibodies that it contains may be put into the blood of a human being. In this case, the body does not use its own antibodies to guard against or to com-

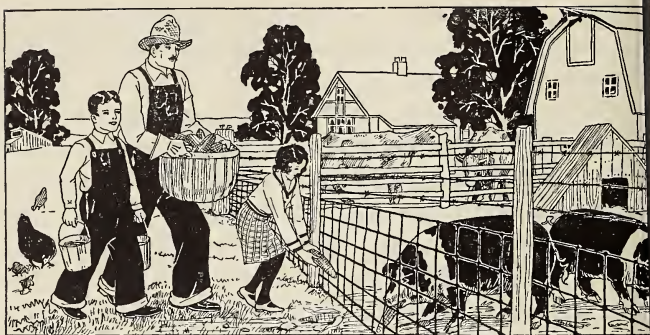
that the disease, but the antibodies *produced by the animal*. This kind of immunization is known as *passive immunization*.

Thus the animal is actively immunized, and later its antibodies are used in the human body for passive immunization. In the case of active immunization the body uses its own antibodies while in the case of passive immunization the body uses antibodies that were produced outside of itself. In active immunization a vaccine is used, while in passive immunization a serum is used.

Serums may be of two kinds, those that produce antibodies that fight the germs themselves (antibacterial serums), and those that counteract the poisons produced in the body by the presence of disease germs. Such serums are known as anti-toxic serums. A serum is ordinarily introduced into the body by means of a hypodermic (i.e., "under the skin") needle. This is an injection, sometimes called an inoculation. The injection is generally placed just beneath the skin, but is sometimes placed in a vein, or in the fluid of the spinal column. A vaccine may be introduced by an injection with a hypodermic needle, as in the case of typhoid, or by scratching the skin as in the case of smallpox.

"Inoculation" is a word that may now be used with propriety in connection with either the introduction of a vaccine or the injection of a serum. In the minds of many it is associated only with





### WHY NOT?

*Owners of livestock protect themselves against loss by having the animals inoculated against various diseases. Their own children should be equally protected against diphtheria and smallpox.*

the use of the hypodermic needle. A commonly accepted, although not scientific, distinction between vaccination and inoculation is that vaccination refers only to the scratching of the skin (as in smallpox), while inoculation refers only to the use of the hypodermic needle. However, *vaccination* is correct whenever *vaccine* is used. It is not the method of introduction that determines the distinction, but the substance (vaccine or serum) that is introduced. As for serums and vaccines, while they are quite different in their scientific composition, they are both used to achieve the same fundamental purpose. Both are used for the preven-



ion, and in some cases the treatment, of infections or germ diseases.

## **STRONG BODY RESISTANCE AND HEALTH**

The regular practice of health habits is one of the best methods of keeping the body resistance as strong as possible. Exercise, sunshine, and fresh air are valuable. Proper food and regularity in elimination of bodily wastes are extremely important. Personal cleanliness is a valuable safeguard against the entrance of disease germs into the body. Rest and sleep are needed for the growth and repair of the tissues.

### **Low Resistance to Disease Becomes Lowered:**

Neglect of health habits lowers resistance to disease. The neglect of even a single one of them has a harmful effect upon the others and upon the whole body as well. Worry, unhappiness, and discontent interfere with the strength of the body's defenses against disease. Such conditions often produce nervousness, make one cross and irritable, interfere with digestion, rest, and sleep, and prevent the cheerfulness so necessary to health.

Worry over becoming sick or about getting well is a great handicap both to the doctor and to the patient, and may lessen the chances of recovery.

Overwork causes a drain upon strength and energy and usually leaves the body weak and poorly

prepared to offer a successful fight against disease.

Avoid wet feet and continued exposure to cold. The rapid loss of body heat at such times often gives the germs a chance to grow, and with the body in a weakened condition they may develop faster than the natural defenses of the body can overcome them. The use of alcohol and tobacco lowers the resistance to disease. These interfere with many of the bodily functions, poison and often permanently injure some of the important organs.

Certain foods have a tendency to cause an acid condition in the blood (see page 251). The blood in its normal state is alkaline, and this is unfavorable to the life and growth of most disease germs. If too many foods that cause acidity in the blood (acidosis) are eaten, disease germs are thus given an opportunity to grow and develop, perhaps causing serious trouble. Some people are very susceptible to acidosis and need to watch this aspect of their health most carefully.

## PRACTICAL APPLICATIONS

### For Effective Study:

1. Name three methods by which the body may be said to defend itself against disease germs.
2. What are:
  - (a) antibodies?
  - (b) antitoxins?
  - (c) natural immunity?
  - (d) acquired immunity?

3. Look up the derivation of the words "vaccination," or "vaccine," in the dictionary. Why are they used in connection with the disease smallpox?
4. When was vaccination first used in the United States, and by whom?
5. Name some of the diseases that Pasteur's discoveries have done much to prevent.
6. Who was Dr. Trudeau, and for what is he famous?

**or Discussion:**

1. Compare Jenner and Pasteur in their relation to the use of vaccination as a method of preventing disease.
2. What is a "culture?"
3. How is acquired (or artificial) immunity produced?
4. Do you agree with the decision that Pasteur was the greatest Frenchman that ever lived? Can you name *any* man of any nation who has done more for humanity?
5. Compare the lives of Pasteur and Koch in regard to:
  - (a) training and later careers
  - (b) discoveries
  - (c) influence

**or Health Habit Formation:**

1. Name some good rules for the building up and the maintenance of our bodily resistance to disease.
2. List any additional health habits or practices suggested by the reading of this chapter.

## V. THE ROMANCE OF SANITATION

We may think of sanitation as the science of public health. It concerns not only the health of the individual, but his health in relation to other individuals. It has to do particularly with government control and regulation of health. This regulation and control concerns itself chiefly with the prevention of the spread of communicable diseases through the supervision of certain activities and conditions, such as housing, food and water supply, sewage and garbage disposal, and other aspects of community hygiene.

Some of the greatest achievements of modern sanitation are those related to the elimination of epidemics of diseases that were caused or spread by insects, vermin, and rats.

### **Insect Carriers of Disease Germs:**

All forms of life have insect enemies. Plants as well as animals suffer from their attacks. Great sums of money are spent each year fighting the insect enemies of our food-producing plants and the flowers in our gardens. Constant warfare must be waged against such destructive pests as the grain-destroying weevils, the European corn borer, the alfalfa beetle, the "cotton boll" weevil, the San José scale on fruit trees, and many others. Insects

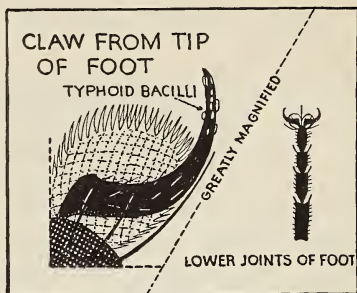
also annoy animals greatly, and may even cause diseases among them.

Insects like flies pick up disease germs from objects that contain them and leave these germs on other things that they touch. This means of spreading germs is a form of "contact" transmission. Other insects, such as the "blood-sucking" mosquitoes, fleas, ticks, and lice, are dangerous agents for the transmission of certain diseases from person to person. When one of these pests bites an infected person, it takes some of the germs into its own body. In the body of the insect the germs pass through a portion of their life cycle. Persons subsequently bitten by the insect are often infected and develop the disease.

### **The Fly Is a Carrier of Disease Germs:**

The time has passed when the house fly should be merely looked upon as a nuisance. Within recent years a hostile attitude has developed toward this pest because it has been definitely shown that the fly is a carrier of the germs of typhoid fever, diarrhea, cholera, dysentery, tuberculosis, scarlet fever, and probably a number of others.

The bodily structure of flies and their habits of living favor the transmission of germs by them. Flies are apparently as well satisfied to feed upon waste materials in stables, "outdoor toilets," and garbage piles as upon the foods in stores and the



### HOW THE FLY SPREADS DISEASE GERMS

*The lower joints of the foot of the fly, with the two claws, are shown (magnified) at the right. At the (greatly magnified) tip of one of the claws are some typhoid germs (also magnified). Notice the pad which enables the fly to hold on when it walks on the ceiling.*

kitchens or dining rooms of our homes. They may pass back and forth between these feeding grounds many times during their active, busy lives, unless precautions are taken to prevent it. Germs are carried by flies upon their body, wings, legs and feet and in their saliva and excretions. The body and legs of flies are covered with tiny hairs which aid in picking up germs and filth. Their feet are moistened with a sticky substance which enables them to cling to walls and ceilings, and also favors the "contact" method of transmitting disease germs.

### Protection Against Flies:

Effective protection against flies includes the



elimination of their breeding places, the screening of doors and windows, and the unceasing destruction of all that succeed in getting past these barriers into our homes.

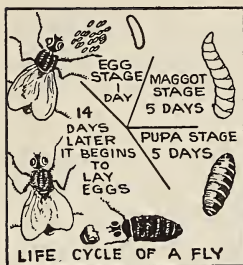
One of the most effective means of getting rid of flies and keeping them away is to prevent them from breeding or multiplying. In order to do this successfully, it is necessary to be familiar with their life cycle. The different stages of development in the life of a fly can be briefly outlined as follows:

1. The female fly lays a hundred or more eggs at a time in stable manure, or when this is not available, in human excreta, garbage, or any decaying vegetable matter, including even damp rags or paper.

2. In about one day after the eggs are laid, they hatch into white, worm-like creatures called maggots (larva). These maggots live and grow in the manure or other suitable substance for about four to eight days, when they come to the surface, and a hard, dark case forms about them.

3. During the next five to seven days, while in this "pupa case" or "chrysalis" stage of development, as it is called, the maggots change into flies.

4. So complete is the change that goes on in the "pupa case" that within an hour or so after the newborn fly emerges, it is a full-grown adult insect. Within a couple of weeks, the female fly is old enough to lay eggs for another generation. If



### PROTECTION AGAINST FLIES

*Keep the house well screened. Prevent the breeding of flies—no collections of rubbish or wastes; a tightly covered garbage can. Swat the fly.*

conditions are favorable, it can repeat the egg-laying process eight or nine times a season. Experts in figures have calculated how many descendants of one female fly could be produced in a single season, provided all the eggs produced flies which lived and prospered. Fortunately, the lack of food, natural enemies, and other unfavorable conditions prevent this occurrence, for the total is "5" fol-

lowed by twenty-nine zeros, a number that is too large for us to comprehend.

Cleanliness is one of the first requirements in controlling the breeding of flies. Keep the premises free from open and exposed accumulations of garbage, manure, heaps of decaying vegetation, and other substances that might be selected by the female fly for her eggs. Outdoor toilets should be carefully screened to prevent their use as breeding-places and also to prevent flies from feeding upon their contents.

In and around stables the disposal of manure in a way that will prevent the breeding of flies is a difficult problem. Manure bins or containers should be fly-proof. If manure is spread out thinly on the ground every few days, the moisture in it will dry out and thus prevent its use as a breeding place of flies.

All doors and windows should be screened to keep out flies, mosquitoes, and other insects that annoy and spread the germs of disease. Screens should be kept in good repair and properly used by all occupants of the house.

The destruction of flies within the house should be unceasing. "Fly swatters" should be kept in convenient places and used whenever needed. "Swat the Fly" campaigns are often organized in communities. In the spring these campaigns are especially valuable for each female fly destroyed early

in the season prevents not one but many generations of flies before the summer is over.

### **Mosquitoes as Carriers of Disease:**

One of the outstanding triumphs in the conquest of disease was the discovery that certain species of mosquitoes transmit the germs of yellow fever and malaria. The mosquito takes the disease germ into its own body when it feeds upon the blood of an infected person. The germs pass a part of their own life cycle in the body of the mosquito and are then injected into the blood stream of other persons afterward bitten by it.

Historical records show that people suffered from the chills and fever of malaria in ancient times. It may have been one of the causes of the downfall of Rome, causing steady deterioration of the health of the Roman citizens. Many guesses were made regarding the causes of malaria, including such things as swamps, marshes, and night air. In fact, the word "malaria" means "bad air" or "night air." Its cause remained unsolved until the closing years of the 19th Century when the "*anopheles*" mosquito was clearly shown to be the sole culprit in spreading malaria.

Yellow fever is an extremely fatal disease that can be traced back for several hundred years. Cases were constantly found in the West Indies and other tropical regions of Central and South America.

it spread, occasionally, far up the coast of North America and was carried in sailing vessels to coast cities in Europe. In 1793 a terrible epidemic of yellow fever occurred in the city of Philadelphia. At that time Philadelphia was the capital city of the United States. Dr. S. Weir Mitchell, in the historical novel called *The Red City*, describes the flight of President Washington and his Cabinet from the Independence Hall near the river front, back to a higher location some eight or ten miles away. Another interesting account of this epidemic may be found in the historical romance, *Blowing Weather*, by John T. McIntyre.

From 1793 until it was finally controlled, yellow fever caused over 100,000 deaths in the United States. In epidemic years the deaths in populous cities were very high. In New Orleans in 1853, for example, nearly 8,000 people died from yellow fever, about 3,100 more in the year 1867, and over 4,000 in the year 1878.

Year after year yellow fever spread its trail of death throughout many parts of the world. Many causes were suggested and remedies proposed to check it, but without success. Even the mosquito was suspected. It remained, however, for Major Walter Reed, an American Army Medical Officer and his associates to prove conclusively, in 1901, that the "*Stegomyia*" mosquito was the carrier of the terrible "yellow fever."





### PROTECTION AGAINST MOSQUITOES

*The most effective control measures are directed against the insects while they are still in the water in the larvae or wiggler stage. At the upper left is the "anopheles" (malaria) mosquito. At the upper right is the culex or common mosquito.*

### The Conquest of Yellow Fever:

Major Walter Reed, the conqueror of yellow fever, was born in Virginia in 1851. He became



a physician and entered the medical service of the United States Army in 1875. After many years of field service at army posts in various parts of the United States, he devoted himself to problems connected with the causes of disease. In the Spanish-American War of 1898, more soldiers died from typhoid fever than from the bullets of the enemy. Dr. Reed found that the common house fly was a dangerous carrier of the germs of this disease and thus helped in advancing its conquest.

In 1900 Major Reed and his associates were assigned by the United States Army medical authorities to study the causes of yellow fever and other infectious diseases that were very prevalent in the Island of Cuba. Cuba had just been freed from Spain at the conclusion of the Spanish-American War and the health of the American soldiers and other governing officials on the Island was a matter of great concern to the people of the United States.

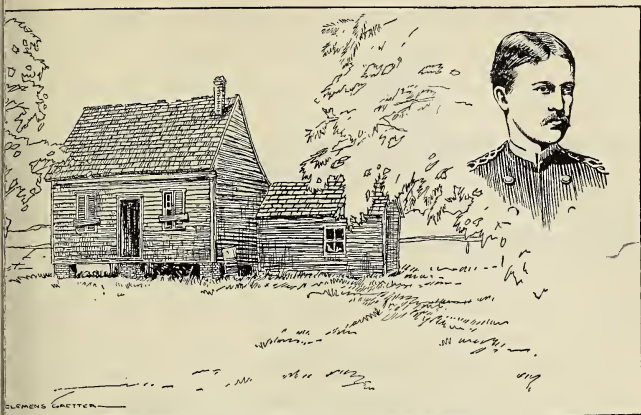
Yellow fever and malaria were among the most dangerous diseases that existed in Cuba at this time. This island with its warm tropical climate afforded natural opportunity for the growth and spread of these diseases, and proper sanitary measures had long been neglected before the arrival of our soldiers. The following death rates from these diseases in Havana, Cuba, a city of 200,000 people, will show how important it was that something be done at once to control them:

Deaths from Yellow Fever in Havana		Deaths from Malaria in Havana	
	No. of Deaths		No. of Deaths
1896 .....	1282	1896 .....	450
1897 .....	858	1897 .....	821
1898 .....	136	1898 .....	1907
1899 .....	103	1899 .....	909
1900 .....	310	1900 .....	325

When Major Reed and his associates arrived at Havana in 1901, they were familiar with the suspicion that had been directed toward the mosquito as a cause of the disease. Two members of the Army Board allowed themselves to be bitten by the particular mosquito that was suspected. Both developed yellow fever. Dr. Carroll recovered but Dr. Lazear died of the disease. These occurrences made them feel sure that the "*stegomyia*" mosquito was the means of its transmission. They determined to test out their belief by further study and set up an experimental camp a few miles outside the city. This camp was fittingly named in honor of their unfortunate associate, Dr. Lazear.

### Discoveries at Camp Lazear:

Yellow fever does not occur in animals, so it was necessary to find persons who were willing to risk the dangers of this disease. Many American soldiers volunteered. In accepting the services of a young soldier who persisted with his offer after all the dangers were pointed out, Major Reed com-



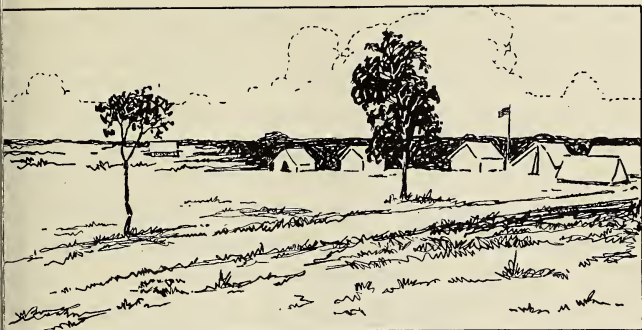
### MAJOR WALTER REED AND BIRTHPLACE

*Major Walter Reed who proved to the world (1900) what had been suspected for twenty years, that yellow fever was transmitted only by the bite of a mosquito. Also his birthplace in Gloucester County, Virginia.*

ented that, in his opinion, "this exhibition of moral courage has never been surpassed in the annals of the army of the United States." During the experiments that were conducted at Camp Lazear, a number of cases of yellow fever developed, but fortunately, all the patients recovered. The discoveries made here were of the greatest importance. They pointed the way to methods which soon led to the complete elimination of the disease in places where it had existed continuously for hundreds of years.

In experimenting with mosquitoes, Major Reed found that, in order to become infected, a mosquito had to bite a person who was ill with yellow fever during the first three days of the illness. Another interesting discovery was the fact that the germ of yellow fever had to pass at least twelve days of their own life cycle in the body of the mosquito before they could cause the disease in a person afterward bitten by it. This solved a puzzling condition connected with the spread of the disease among the family of a yellow fever patient. For twelve days after the case was discovered, persons could live in the patient's house in safety and then suddenly, after twelve days had elapsed, the disease developed at an alarming rate among these same people. During this twelve day period, the yellow fever germs had been developing inside the body of the mosquito.

Up to this time it was believed that yellow fever could be carried by the clothing, bedding, and other materials that had been contaminated by a person ill with the disease. In order to disprove this theory, Major Reed had a small building constructed in a very unsanitary way. It was poorly ventilated and its windows were small and placed so that very little sunshine could be admitted. Several men slept for twenty successive nights in this room wearing the soiled clothing and using the unwashed bed linen of yellow fever patients. No



### CAMP LAZEAR

*This is the scene of heroic experiments which, under the leadership of Major Walter Reed, resulted in proving to the world that yellow fever is the result of the bite of the *Aedes aegypti*" (yellow fever) mosquito.*

One of the men developed the disease. This helped to fasten the guilt of yellow fever more strongly than ever upon the mosquito as the only method of its transmission.

In order to show how yellow fever can be controlled, Major Reed conducted a very spectacular and convincing experiment. He had another building constructed and carefully screened so that mosquitoes could not get in or out of it. He erected a wire-netting partition through the middle of the building so that it was divided into two rooms. The wire partition allowed the air to circulate freely within the building because he wished to prove that



the air had nothing to do with the spreading of yellow fever. In order to show that the building was free from yellow fever, a man slept on each side of the partition for several days with no ill effects. Dr. Reed took out the man from one of the rooms and set free a number of infected mosquitoes in it. An American soldier volunteer entered the infected room and permitted himself to be bitten by several of them. Four days later the brave volunteer had developed a case of yellow fever, from which he recovered. The two men who lived and slept in the opposite side of the wire screen remained perfectly well during all this time, showing that it was the infected mosquitoes that caused the disease. Major Reed then "disinfected" the room by catching all the infected mosquitoes he had set free. The man who had slept originally in this room without any ill effects now returned and stayed for several more days without developing any signs of yellow fever. Dr. Reed now considered he had proved the mosquito the sole culprit in the spread of yellow fever. In his report he concluded "that the spread of yellow fever can be most effectively controlled by measures directed to the destruction of mosquitoes and the protection of the sick against these insects."

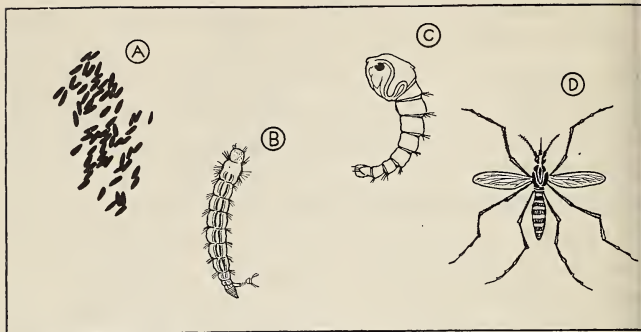
### **Yellow Fever Is Conquered:**

The findings of Major Walter Reed and his asso



ates were put immediately into use by another American Army Officer, Colonel W. C. Gorgas. Colonel Gorgas was Chief Sanitary Officer in Havana, Cuba, while Major Reed conducted his experiments at Camp Lazear, just outside that city. He had kept in close touch with Major Reed's work and was familiar with the discoveries that had just been made. As Major Reed had pointed out, the problem of preventing yellow fever should be attacked in two ways: first, to prevent mosquitoes from biting yellow fever patients during the first three days of the disease; and second, the destruction of the mosquitoes.

Colonel Gorgas attacked the first problem of preventing mosquitoes from biting yellow fever patients by requiring every case of yellow fever to be reported immediately to the Health Department. The patient was removed in a screened ambulance to a screened room in a hospital or kept in a screened room in his own home. If the patient chose to remain at home, the Health Department inspected the screening of the sick room, making such additions or repairs as necessary. They erected double doors and placed a guard at the entrance so that both doors would never be open at the same time. So quickly did these health officials do their work, that it was usually within an hour after notice of a case came to the central office day or night, that the patient was either removed to a



*THE "YELLOW FEVER" MOSQUITO (All Enlarged)*

*A.—Eggs. B.—Wiggler. C.—Pupa. D.—Adult Female*

hospital or was being screened in at his own home.

The progress of yellow fever is rapid, death in fatal cases usually occurring in five or six days. This allowed time enough for the officials to have the house thoroughly disinfected before the twelve day period was up. The fumigation or disinfection was usually done by the burning of sulphur or insect powder.

The warfare against the mosquitoes in the city of Havana was directed, not so much against them in the adult, flying stage as in another and more easily controlled stage of their life cycle. All species of mosquitoes lay their eggs in water or moist places. The female *stegomyia* or yellow fever mosquito lays her eggs in the rain barrels, cisterns, flowerpots, cans, and other water-containing recep-

acles about the houses. In about thirty-six hours the eggs hatch into larvae called "wigglers." The wiggler moves about freely and breathes air through a little tube that it thrusts up through the surface of the water. The pouring of oil upon stagnant water containing these wigglers so coats the surface of the water that the wiggler cannot get air and it dies. This is one of the most effective ways of destroying mosquitoes in marshes and swamps. If the wiggler is not destroyed, in six or seven days it changes to a "pupae" or "tumbler," and after another day or two a full-formed, winged mosquito emerges. The campaign, therefore, was directed against the mosquito during its life stages in the water.

The city of Havana was divided into a number of districts, each in charge of a sanitary inspector. Each inspector and his men visited the houses regularly. They screened rain barrels and cisterns to keep the mosquitoes from laying their eggs in them. They mended sagging roof gutters so that water would not collect there. They carted away and destroyed wagon loads of old cans, broken flower-pots, and all receptacles that might hold water and breed mosquitoes.

In the open sections of the city and in the schools, low places were drained, grass and weeds were cut down, and everything possible was done to prevent the growth of the pests.

Ships coming into Havana were fumigated and the crews quarantined for six days.

As a result of this warfare against the mosquito in Havana, yellow fever rapidly disappeared. If you look back to page 98 you will see that there were hundreds of deaths from it each year prior to 1901 when these sanitary measures were introduced. In the year 1901 there were only eighteen deaths. So rapidly did the disease vanish that the monthly record is significant and can be observed as follows:

	1900	1901	
January	8	7	
February	9	5	
March	4	1	
April	0	0	The last case of yellow fever occurred in September, 1901, and there have been no cases recorded since that date.
May	2	0	
June	8	0	
July	30	1	
August	49	2	
September	52	2	
October	74	0	
November	54	0	
December	20	0	
TOTAL	310	18	

The warfare against the yellow fever mosquito brought relief from the malarial mosquito at the same time. The yellow fever mosquito breeds principally around houses, while the malarial mosquito

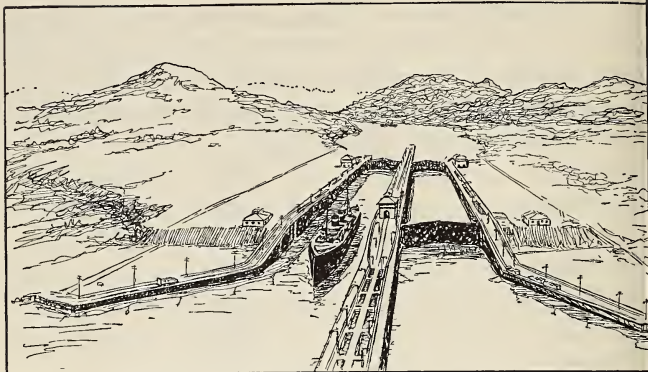
lives in pools, lakes, streams, and damp and swampy places in the country. Because of the greater area and extent of its natural home it is harder to exterminate, but the following results show that malaria also was greatly reduced:

1900.....	325	1907.....	23
1901.....	151	1908.....	19
1902.....	77	1909.....	6
1903.....	51	1910.....	15
1904.....	44	1911.....	12
1905.....	32	1912.....	4
1906.....	26		

General Gorgas states that in a city the size of Havana, only four deaths in a year can be judged safely as coming from outside the city—and that malaria had been exterminated in Havana in 1912 as completely as yellow fever had been in 1902.

### **Disease Conquered in Panama:**

The Isthmus of Panama has been a land of romance and adventure since the days of Columbus. The gold and silver treasures of the natives first attracted Spain. For over two hundred years Spain ruled the country and battled against the pirates and buccaneers who often swarmed down upon the cities, burning, killing, and robbing as they went. By 1824 Spain had been driven out of this region of the world and Panama became a part of the republic of Columbia. In 1903 another change oc-



### PANAMA CANAL

*Because of the work of General Gorgas as Chief Sanitary Officer, the engineers of the United States were able to succeed where others had failed.*

curred, and the free and independent Republic of Panama was formed.

The Atlantic and Pacific Oceans are but fifty miles apart at Panama. This fact led to many plans to open a route across the Isthmus and thus avoid the long journey around South America. The discovery of gold in California in 1848 brought large numbers of people to the region. The travel increased so greatly that a railroad was built from the Atlantic to the Pacific sides to take care of it. This was completed in 1855, after six years of very difficult labor in the tropical swamps and jungles. Yellow fever and malaria were responsible



for over two thousand deaths among the workmen.

Many plans for a canal across the Isthmus were proposed, but little was attempted until 1881. In that year a gigantic undertaking was begun by a French Company. For eleven years large numbers of men battled unsuccessfully against the hardships of climate and disease. Yellow fever and malaria epidemics occurred. Many expensive and elaborate hospitals were constructed, but as the place of the mosquito in the transmission of these diseases was unknown, they spread unchecked. It is estimated that out of a total of 86,000 workmen that were employed throughout the eleven years of French construction, at least fifteen thousand died of disease. Largely as a result of the ravages of disease, the French abandoned their attempts. They withdrew in 1892, leaving behind their machinery and their partly completed "ditch" across the Isthmus. As a result of the tremendous losses of life in these construction projects, Panama obtained the reputation of being one of the unhealthiest places in the world.

For many years the abandoned French machinery in Panama rusted away and the jungle growth crept in and covered everything with a tangle of vines and trees. This condition continued until the United States purchased a strip of land ten miles wide across the Isthmus, bought up the old French excavations and planned another attempt to con-



GENERAL GORGAS

*General William C. Gorgas, who conquered yellow fever and malaria at Havana and Panama. His words are famous: "Take a good look at this man, boys, for it's the last case of yellow fever you will ever see. There will never be any more deaths from this cause in Panama."*

nect the Atlantic and Pacific Oceans by a canal. In planning for the construction of this canal, attention was immediately given to the control of the diseases of the region.

In 1904, Colonel Gorgas was sent to the Canal Zone as its Chief Sanitary Officer. He had succeeded so well in stamping out yellow fever and reducing malaria in Havana, Cuba, that he began at once to apply the same methods in this disease-infested region. Yellow fever was first attacked. All houses in the Zone were fumigated to kill the infected mosquitoes that might be sheltered in them. Because the eggs of the mosquitoes are laid in water, and the larvae or "wigglers" must

pass this stage of their development in it, all water containers were properly protected or removed. Rain barrels and cisterns were screened. Old cans, flowerpots, and things that might collect water and provide a breeding place for mosquitoes were collected and destroyed. As a result of these vigorous measures, Colonel Gorgas was able to report that in less than two years yellow fever had been completely eliminated, and not another case occurred among the workmen throughout the construction of the canal.

The drive against "malaria mosquitoes" required a somewhat different attack. It had been found that the mosquito that spreads malaria preferred to live in country districts rather than in and about the houses of towns and cities. When it is understood that it rains a part of every day for the eight months of the rainy season in Panama, we can see how extremely difficult was the problem of draining the pools and swamps of the Canal Zone. In attacking the problem, the Canal Zone was divided into a number of districts. The inspector in charge of each district was responsible for the construction of ditches, the cutting of weeds and grass, and the oiling of pools and streams that could not be drained. Millions of feet of ditches were dug and large areas of mosquito-breeding ground were drained. Constant watchfulness was used and malaria among the workmen gradually decreased. At

the height of the work, over 40,000 men were employed in the construction of the Panama Canal. Colonel Gorgas reported the cases of malaria as follows:

1906 — 821 per 1000	1910 — 187 per 1000
1907 — 426 per 1000	1911 — 184 per 1000
1908 — 282 per 1000	1912 — 110 per 1000
1909 — 215 per 1000	1913 — 76 per 1000

### Other Insect Pests That Spread Disease:

Insects such as lice and fleas are household pests that sometimes spread disease. Lice are wingless insects with pointed claws and a sharp beak or "proboscis." It uses the proboscis to pierce the skin in order to obtain the blood that forms its food supply. One form of lice breeds in the hair and scalp. Their bite causes itching and irritation, and sores often result. Lice can be eliminated by destroying their eggs or "nits." Coal oil or "larkspur" will kill them. They can then be loosened from the hair by washing it in vinegar, after which the dead lice can be removed by a fine tooth comb and vigorous brushing.

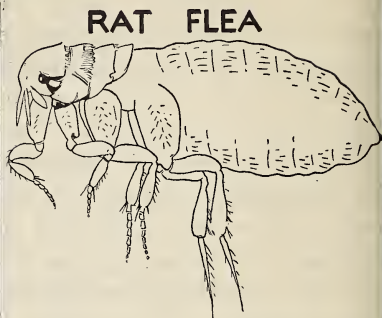
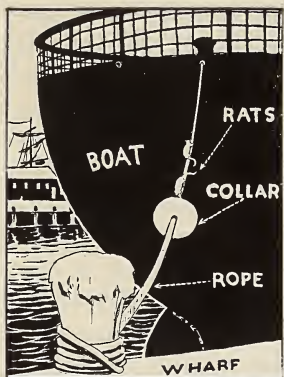
Body lice live chiefly in the seams of the clothing and bite their host in order to obtain their food. Getting rid of this pest can be accomplished by careful and constant attention to personal cleanliness. Body lice and sometimes head lice are guilty of transmitting the deadly "typhus fever." Typhus

fever is a different disease from typhoid fever and can be communicated from person to person. It breaks out and spreads rapidly in dirty and overcrowded places, and is sometimes referred to as "jail fever," "camp fever," or "ship fever." In some of the countries of southeastern Europe during the World War, the overcrowded conditions of refugees and soldiers resulted in outbreaks of this disease. In combating this disease, clothing is disinfected and living conditions improved and made more sanitary. The United States and other nations maintain a strict quarantine against the introduction of the germs of typhus fever on ships that come from any parts of the world in which the disease exists.

### **Fleas Are Carriers of Disease:**

Fleas are wingless insects that live on the bodies of many different animals, like cats, dogs, squirrels, and rats, and often transfer their homes to human beings. The flea that lives principally upon the bodies of rats is the carrier of the "bubonic plague." Bubonic plague or the "Black Death" is the terrible disease that swept through Europe in the Middle Ages, destroying on one occasion approximately one-fourth of the population. (See pages 30-32). It is still found in some parts of the world where crowded, unsanitary conditions of living favor the breeding of the rats that in turn favor the spread





Highly Magnified - 25 Diameters

### PROTECTION AGAINST RATS

*When steamers come to American ports from tropical countries, they are required to put "collars" on the hawsers by which they are tied to the wharf. This prevents rats from landing. This device is a common sight along the river front in New York City and other large seaports.*

of the disease. It is estimated that in India during the fifteen years from 1896 to 1911, there were seven and one-half million deaths from this bubonic plague.

### Rats Are Dangerous Pests:

The rat is associated particularly with the spread of the bubonic plague. The germs of this disease live in fleas that infect them.

Rats are great destroyers of property, the losses running up to hundreds of millions of dollars each



year. They annoy the farmer by destroying his crops in the fields after they are harvested. They live and destroy in city stores and in homes, biting their way through wooden partitions and boxes to reach their food.

The fight against rats should include a number of protective measures, such as:

1. Extermination of the rats by poisoning, fumigation, flooding, and trapping.
2. Shutting out the rats by the rat-proofing of homes, outhouses, business buildings, etc.
3. By removing piles of refuse, garbage, etc., and by elevating piles of lumber.
4. Exterminating rats on ships and using rat guards to keep rats from coming ashore and from going from the land to the ships.
5. Extensive rat trapping in an infected area.

### **Community Hygiene:**

In all countries of advanced civilization, and in some less advanced, the growth of large cities and the proximity of even those who live in rural sections has forced health problems upon the various governments. Many of these problems are heritages from the unsanitary and pestilential cities of the Middle Ages. As modern science has indicated the way, national, state, and local officials have been forced to make provision for the protection of the health of their citizens.

The public health services of our own national government may be summarized as follows:

1. Quarantine health service. Inspection of incoming ships, crews, and passengers to guard against the entrance of communicable diseases; detention, isolation, or deportation where necessary.
2. Supervision of certain interstate health conditions, as for example, drinking cups and purity of drinking water on trains.
3. Medical and hospital treatment for ex-service men, and for sailors of the merchant marine.
4. Expert advice and assistance for local authorities.
5. Research into causes of diseases (centered around the Hygienic Laboratory in Washington, D. C.)
6. Supervision of the manufacture of vaccines, serums, and antitoxins to insure their purity.
7. Health education for the public through leaflets, bulletins, and radio.
8. Activities of certain departments and bureaus of the national government, such as
  - Department of Agriculture: Foods, etc.
  - Labor: Child hygiene.
  - Commerce (Census Bureau): Vital statistics. (See page 171).
  - Interior (Office of Education): Schools, health education, etc.

The health activities of state governments are generally vested in a State Board of Health, or some similar agency. While these activities vary somewhat for the different states, they may be summarized as follows:

1. Supervision of local boards of health.
2. Uniform regulations for food, milk, and water supplies, sanitary disposal of sewage and garbage, and housing conditions.
3. Collection of vital statistics. (See page 171).
4. Child welfare and maternal hygiene.
5. Maintenance of public health laboratories for analysis of food, milk, water, and other substances for evidence of disease germs.
6. Publicity campaigns; warnings and advice of timely nature to the citizens through bulletins, newspaper publicity, and radio.

The activities of local health authorities—county, city, town, or borough—should include:

1. Recording of births and deaths.
2. Supervision and control of contagious diseases.
3. Provision of pure and adequate water supply, and frequent testing of its purity.
4. Provision of proper systems of disposal for sewage and garbage.
5. Milk and food inspection and control.
6. Enforcement of housing regulations to overcome filth, dampness, dirt, and overcrowding.
7. Provision of baby clinics, health centers, free clinics for advice and treatment, and hospital service.
8. Health publicity and education—bulletins, newspaper articles, health drives and campaigns, lectures, and radio.

## PRACTICAL APPLICATIONS

or Effective Study:

1. Name some diseases that are carried by insects.

Name the carrier and tell how the disease may be prevented.

2. Name some measures that should be included in adequate protection against the fly.
3. Describe briefly the discoveries of Dr. (Major) Walter Reed at Camp Lazear in Cuba.
4. Name some of the measures used to stamp out yellow fever at Havana.
5. What methods were used to control malaria in the Canal Zone?
6. Name some measures that should be used as protection against:

(a) mosquitoes

(b) lice

(c) rats

#### For Discussion:

1. How did Major Walter Reed show that yellow fever was transmitted *only* by the bite of a mosquito?
2. Discuss the relative contributions of Major Reed and Colonel Gorgas to:
  - (a) the elimination of yellow fever at Havana
  - (b) the building of the Panama Canal.
3. Why is malaria more difficult to control (prevent) than yellow fever?
4. Would it have been possible for the army engineers to have built the Panama Canal without the assistance of the army medical officers?
5. Look up Nagouchi. Who was he? How may he be compared to Dr. Lazear?
6. Why should rats be regarded as destructive? dangerous?

#### For Health Habit Formation:

1. List in written form the desirable health habits and practices suggested by the material in this chapter.

## **VI. PROGRESS IN SURGICAL SKILL**

### **Earlier Days:**

Among the ancients there was some attempt at simple surgical operations, such as the lancing of abscesses. Amputations of limbs were sometimes attempted as a result of wounds in battle or of accidents. But practically no attempt was made to operate on living people where the operation required the opening of the chest or abdomen. Both the knowledge and the skill were lacking.

During the Middle Ages much of the surgery for the common people was performed by barbers. The barber's pole is a relic of those days. The red stripes indicate blood, and the white stripes indicate the white bandages. The pole represents a staff which the patient held in his hand for certain operations. Or it may have evolved in some way from the traditional staff of the physician. The staff has always been one of the symbols of medicine. The barbers of the old days put the pole outside with the bandages hanging to it as a sign of their profession. Barbers did much of the necessary operating on wounds during the wars of the Middle Ages. They generally accompanied armies for that purpose.

### **Essential Knowledge Required:**

By surgery is meant the treatment of abscesses or

wounds by or with the use of instruments. The development of real surgical skill dates from very recent times, about 1850. It was held back by a number of causes, all due to a lack of knowledge. Modern surgery is based on:

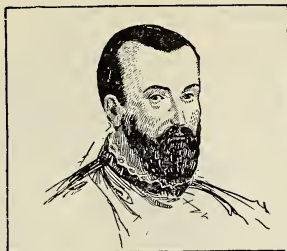
1. An exact knowledge of the human body.
2. A knowledge of how to stop great loss of blood (hemorrhage) during the operation.
3. A knowledge of anaesthesia—how to make the patient insensible to the pain of an operation.
4. A knowledge of how to prevent the wound of an operation from becoming infected (blood poisoning).

### **Advance in Anatomy:**

Very little was known of the anatomy of the human body until late in the Middle Ages. Galen's work was known but it contained many errors, as his knowledge was based on the dissection and anatomy of animals. Religious beliefs of the ancients and of the people who lived during the Middle Ages held that it was a sacrilege to interfere with the bodies of the dead.

The greatest surgeons and physicians of the Middle Ages were among the Jews, due in many cases to their familiarity with the works of Galen through their contacts with the Arabs and the Moors. It was the Arabs more than any other





### VESALIUS

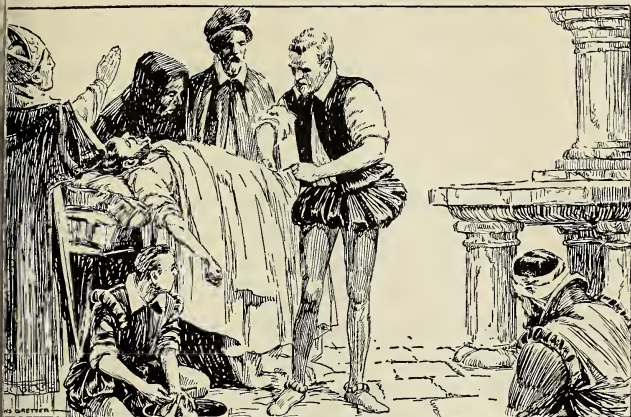
*By his dissections made important corrections in theories of Galen which had been accepted for centuries*

who kept alive the culture and knowledge of the Greeks after the fall of Greece and Rome. During the latter part of the Middle Ages, however, medical schools began to secure special permission to use the bodies of the dead and to secure them also by secret means. Vesalius (16th Century) made important discoveries correcting some of the errors of Galen. He dissected bodies and made very careful observations of everything he saw. His discoveries resulted in much discussion and argument, as a result of which other investigations were made. Gradually the foundation of exact knowledge of the human body, so necessary to modern medicine and surgery, was laid. Credit must be given to Vesalius for beginning this work. Servetus, a Spaniard, and later Harvey, an Englishman, made important discoveries regarding the circulation of the blood.

## The Gifts of Paré:

Paré, a great French surgeon of the 16th Century, rediscovered how to stop excess bleeding in wound by tying the large blood vessels. This had been known to the ancients, but was seldom practiced because of the danger of blood poisoning which made even a slight wound dangerous. Burning (cauterizing) the flesh or using hot pitch or oil was preferred. It was more painful, but infection was less likely to result. This was because the heat sterilized the wound, or destroyed dangerous germs, although the explanation was not known to the men of earlier days. The full value of Paré's method of tying blood vessels was not realized until the 19th Century when a famous English surgeon, Joseph Lister, discovered how to disinfect the wound of an operation. Then surgery became comparatively safe, although still painful.

Paré also made an important contribution to human welfare by his attention to the care of the sick which in those days was largely in the trust of ignorant and unclean people. In his methods he stressed light but wholesome nourishment, quieting drinks, fresh air, sunshine, massage, cleanliness of the patient and of the bed, and diverting amusements for the mental peace of the convalescent. His work, however, was limited to the highest nobility of France, and his influence was therefore not general. It was not until three hundred years later



### AMBROSE PARÉ AT THE SIEGE OF METZ

*Paré was famous for his treatment of wounds. He recovered the art of tying a blood-vessel (ligature) thus reducing the possibility of bleeding to death. He brought the world one step nearer the achievement of the great surgical skill of today.*

at the influence of Florence Nightingale made good nursing universal.

### Infection of Wounds:

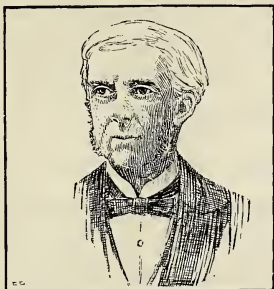
Throughout the centuries very little was known about the transmission of disease. Disease was blamed on food, ventilation, climate, bad air, and other things which might have been a means of transmitting a disease, but the real cause—the existence of disease germs—was unknown. It is the

germ in the food, in the air, or on the hands that causes the trouble. Of these things, Pasteur, the great French physician, was to tell the world later.

Not knowing about disease germs, people did not realize that wounds might be infected with germ by contact with something unclean. Blood poisoning caused by the infection of a wound or raw surface had been known in many forms for centuries. Millions of people died of it, yet the cause was not known, nor was the method of prevention.

Our own great man of letters, Dr. Oliver Wendell Holmes, was also a physician of great ability and intelligence. Although he did not know the real cause, yet his keen mind perceived that blood poisoning in many cases was carried on the hands of a physician—even though his hands seemed to be clean. By that he meant “clean” as washed in soap and water. (But disease germs may resist soap and water. Dr. Holmes did not know about germs of course). The most eminent medical men of that day (about 1845) opposed Dr. Holmes in his opinion, but time has proved that he was absolutely right in his belief and contention. Today, we know that the hands are not medically clean unless they are washed in a chemical solution or disinfectant of some kind. A modern surgeon sometimes spends as much as fifteen minutes in carefully disinfecting his hands before an operation.

In 1865 Semmelweis, an Austrian physician



### DR. OLIVER WENDELL HOLMES

*A great American physician as well as writer. Long before the days of Pasteur and Lister, he proclaimed: "Clean hands may carry disease." Was he right?*

After years of patient investigation into the causes of certain cases of blood poisoning, discovered precisely what Dr. Holmes had contended was true. By having his assistants in hospital cases under his supervision wash their hands in a chemical solution before touching a patient, he immediately reduced deaths from blood poisoning from an average of one hundred and twenty in every thousand cases to twelve in every thousand, an average saving in lives of ninety per cent. This discovery of Semmelweis did not become generally known, however. Semmelweis was a great physician, but he had a limited education and was without the means of making his discoveries well known. Ten years later (1875) Joseph Lister, an Englishman, was



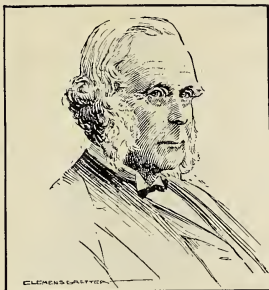
to make known to the world what Holmes and Semmelweis had previously pointed out in a limited or local way. You will note how comparatively recent these discoveries are.

### **Sir Joseph Lister:**

This is the man who has saved millions of lives because of his discovery (1876) of how to combat or control blood poisoning. He has been called one of the greatest surgeons of all time, was knighted for his services, and lies buried with the other great figures of English history in Westminster Abbey. Before Lister's discovery, any wound, no matter how slight, might result in blood poisoning and death. Consequently all wounds, sores, and operations were very dangerous.

Lister conceived the idea that blood poisoning might be carried to open wounds by the air. The idea came to him after reading of the discoveries of Pasteur. He tried spraying carbolic acid in the air, painting wounds with it, and wrapping them in bandages that had been dipped in a solution of carbolic acid. Of course, some germs do travel in the air, but the vast majority of wound infections come from contact with germs on the hands or instruments of those treating the patients. The carbolic acid, however, had the effect of disinfecting the wound and the bandages. The number of cases of blood poisoning was immediately reduced.





### SIR JOSEPH LISTER

*He brought the achievements of modern surgery still closer to the patient when, following Pasteur's discoveries, he found a method of sterilizing wounds and surgical instruments.*

The safety of modern surgery is largely based on the discoveries of Lister. It has been found that either heat or a chemical solution may be used to destroy germs, according to the nature of the thing to be sterilized. All of the instruments used by the surgeon are sterilized by heat to destroy germs and to prevent infection of the patient's wound. The surgeon washes his hands with a disinfectant (antiseptic solution), and the dressings of the wound and the bandages are also made germ-proof by sterilization. The surgeon uses a light mask over his mouth and nose during the operation to prevent germs from being breathed into the wound. He also wears rubber gloves that have been sterilized in dry heat containers.

## Modern Antiseptics:

Today no modern home is without its handy antiseptic solution. There are many excellent preparations on the market, and new ones are being constantly brought forward. Each one is a possible improvement over the last. Many of the modern antiseptics are painless or even soothing to the wound, an important consideration to adult as well as child. If you are in doubt, your physician or reputable druggist can recommend such a solution.

It is decidedly dangerous to wash out a wound with water that has not been boiled. Germs often inhabit drinking water that has been obtained from wells. The water from a well-regulated city system can usually be depended upon to be germ-free but even so it is strongly recommended that all wounds be encouraged to bleed freely and then washed in water that has been boiled. A teaspoonful of common table salt put in a pint of boiled water will make a solution that will soothe and tend to heal wound tissue. (Normal saline solution).

Iodine, mercurochrome, boric acid as well as other common antiseptics (against sepsis or pus) are in daily use but they should be applied in emergencies only and by those skilled in their use. If there are no medical supplies available, the wound should be covered with a clean bandage or one that has been placed in boiling hot water and then permitted to cool before applying over the wound.



### FLORENCE NIGHTINGALE

*She not only saved many lives by improving the conditions under which patients were nursed, but she made nursing a respected profession.*

#### **Florence Nightingale (1820-1910):**

Florence Nightingale is famous as the woman who not only made nursing respectable, but also greatly improved the conditions of nursing. Her great work was done about the middle of the 19th century. Previous to this time most of the nursing was done by people of no training. Generally, they were ignorant and careless. During the Middle Ages most of the nursing was done by menservants or by women of little respectability whose unclean persons carried disease from person to person.

Florence Nightingale was an English woman of good family who had received some training in nursing. When war broke out between Russia and England in 1854, she took charge of one of the

hospitals for the treatment of wounded soldiers. She had as her assistants forty English women with similar training. So much good resulted from their careful handling of the sick and wounded, that the attention of the world was drawn to the value of *trained* nurse. A great movement for the training of nurses followed, and the low type of person who previously served the sick in hospitals and homes was replaced by the trained nurse. Hospitals became clean and healthful places. Florence Nightingale made nursing a respected profession for men and women, and her influence for the well-being of mankind is beyond calculation.

### Clara Barton (1821-1912):

Clara Barton is famous as the founder of the American Red Cross. The memory of Clara Barton is to the people of the United States what the memory of Florence Nightingale is to the people of the British Empire. It was Clara Barton in the United States who applied the ideas and ideals that Florence Nightingale had brought into world wide renown. Florence Nightingale did her first great work in the Crimean War, between England and Russia, during the years 1854 to 1856. Clara Barton did practically the same thing for the wounded during our Civil War, 1860 to 1865. Their careers were strangely parallel even to the dates of birth and death, which almost coincided.



CLARA BARTON

*'The Angel of the Battlefield' and the founder of the American Red Cross*

Some distinction might be made between the two men. Florence Nightingale was famous for the application of her ideas to hospital work. She was a great organizer as well as humanitarian. While Clara Barton was also an organizer and was responsible for improved care of the wounded, much of her work was actually done on the battlefield. Her zeal for the care of wounded soldiers took her within range of the guns right behind the firing line. For this reason she was called by the soldiers "the Angel of the Battlefield" and so became known to the people of the United States.

Her life is full of lessons valuable to all of us. As a young girl she was very timid and bashful. She was afraid to rise and recite in school and yet later she risked her life many times on the field of

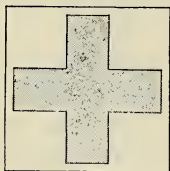
battle. Her interest in nursing began from having nursed her own brother during an illness some years before. "Mighty oaks from little acorns grow." As a young woman, she took up the career of a teacher. Although she was by nature timid and modest, her students soon learned to love and respect the high quality of her character.

When the Civil War broke out, she was teaching school in Bordentown, N. J. Under her guidance the pupils brought in pennies to contribute to the care of the wounded. But she soon answered the larger call and went personally to help care for the sick and the wounded. She thus started on a career of fifty years (she lived to be over ninety) of service in the relief of suffering. She participated in the relief work of the Franco-Prussian War of 1870. In 1881 the American Red Cross was founded largely through her efforts although it was not officially incorporated by Congress as the American National Red Cross Society until 1904. Through this organization and through her personal efforts she was untiring in the relief of suffering wherever in the world it might be found or from whatever cause—war, or fire, or flood, or earthquake, or pestilence.

Before the entrance of the United States into the recent World War, money and supplies to the value of \$4,000,000 were sent to every nation engaged in war activities; within six months after the United



ates entered the War, over \$100,000,000 had been  
ised for the relief of suffering. In every city,  
wn, and village of this country people contributed  
some way to the success of the Red Cross work,  
d throughout the various countries of Europe,  
representatives of the American National Red Cross  
ciety were engaged in the distribution of its com-  
rts. Even today the American Red Cross answers  
mergency calls from abroad or at home. It is  
rhaps the most powerful single agency in the  
hole world for the relief of suffering. The Junior  
ed Cross is a part of this great organization.



### THE RED CROSS

*International symbol for the relief of suffering. Its use  
reminiscent of the Knights of Malta and the Maltese  
oss.*

### The Red Cross:

The Red Cross Society has branches in many  
untries. United, they commonly are known as the  
ternational Red Cross. The symbol of all branches  
the organization is the plain block (Greek) cross  
red on a field of white.

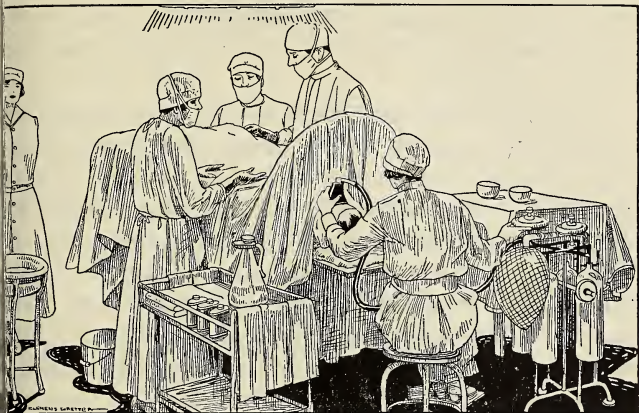
It is sometimes known as the Geneva Cross, taken

from the coat-of-arms of the city of Geneva, where the first Red Cross conference was held in 1864. It is worn as an arm band by the ambulance corps and other Red Cross workers during battle to distinguish them from the soldiers. All armies, friend and foe, respect Red Cross workers because of the errand of mercy to the wounded and do not knowingly harm them.

### **The Great Boon—Anesthesia:**

It is hard for us to realize the great blessing that was conferred on humanity when a way was found to lessen pain or deaden it entirely. This is particularly important during a surgical operation. The more serious the operation the more important it is. Not only is the patient saved great pain and suffering, mental as well as physical, but he can also be made unconscious during the operation himself, so that the surgeon may use his instruments with precision and delicacy without fear of disturbance.

How difficult it is to believe that this state of affairs dates back only to the middle of the last century, about 1850! Before that time operations opening the abdomen or amputating an arm or leg had to be performed while the patient was conscious, yelling and screaming with pain and fright. Strong men were required to hold the patient or else he was tied securely so that he could not move.



### A MODERN SURGICAL OPERATION

*What steps are taken to prevent the infection of the wound? The nurse in the foreground is applying additional anesthesia as needed so that the patient may sleep peacefully through it all, unconscious of either pain or fear.*

The surgeon had to work as quickly and as carefully as possible, considering the disturbing conditions about him. The danger and the risk for the patient and the chances against recovery were all very great. Compare this with the ideal conditions of today. The patient is wheeled into the operating room as though in a quiet sleep. His muscles are relaxed and he cannot feel pain. The doctor and the nurses may work quietly and at their best. The operation may be prolonged for several hours if necessary. All precautions have been taken to

see that the wound of the patient is not infected by the dressing, bandages, instruments, or the hands of the operators.

In earlier centuries, drugs were sometimes given to dull the pain of an operation, but their use was not satisfactory, because they had to be swallowed and frequently the drug acted as a poison in the system. Modern anesthetics (ether, chloroform, and "gas"—nitrous oxide) are administered in small quantities by being inhaled into the lungs. They can be administered in small doses, from time to time, during the progress of the operation, and the natural respiration of the patient brings pure air to the lungs and causes him to be restored to consciousness rather quickly. Drugs were also found to be rather hard on the heart as well as poisonous in their effects and, therefore, not satisfactory. Sufficient quantities of them could not be safely taken to render the patient unconscious of pain. Intoxication with alcoholic liquors was at one time used as a means of making operations less painful, but this too had undesirable ill effects.

An American dentist named Wells was the first man in the world to make practical use of a modern anesthetic. He was interested in being able to extract teeth without pain, and received his idea during attendance at a lecture. He used nitrous oxide ("gas"). Sir Humphrey Davy, a famous scientist of England, had conceived the idea that

trous oxide might be used to deaden pain, about twenty years earlier, but he made no practical application of the idea.

A former partner of Wells, named Morton, two years later (1846) used ether to deaden the pain incidental to extracting teeth as an experiment, and worked so successfully that he was invited to give ether to a patient about to undergo a rather serious surgical operation. Dr. Morton gave the ether, and the surgeon performed the operation. It was entirely successful. The famous Dr. Oliver Wendell Holmes was the first to give the new process a name. Some one asked by what name it might be called, and he suggested "anesthesia" from a Greek word meaning loss of sensation or feeling.

It has since been determined that a Dr. Long of Athens, Georgia, had used ether for a surgical operation about 1842, or four years before Dr. Morton. He is not generally credited with the discovery, however, because no publicity was given to its use of it.

In 1847, Dr. Simpson, a famous physician of the University of Glasgow, discovered the use of chloroform as an anesthetic. It is interesting to note that since those days chloroform has been largely used in England, while ether is preferred in America.

There are two kinds of anesthetics—general and local. A general anesthetic is one which causes loss of consciousness and temporary loss of pain in all

parts of the body. Nitrous oxide, ether, and chloroform are general anesthetics. A local anesthetic is one in which the patient retains consciousness but loses pain or feeling in the part to which the local anesthetic is applied. Cocaine (discovered in 1879) is a type of local anesthetic and has wide use among dentists to deaden pain in extracting temporary teeth. Novocaine is a local anesthetic that is much used for minor operations.

Since the introduction of nitrous oxide, ether, and chloroform as anesthetics about the middle of the nineteenth century, there have been certain improvements and innovations in the use of anesthetics, but the great boon to humanity was conferred at that time.

## PRACTICAL APPLICATIONS

### For Effective Study:

1. Indicate briefly the nature of the contribution of each of the following to the advancement of modern surgical skill:

Galen

Harvey

Paré

Semmelweis

Lister

Nightingale (Florence)

Barton (Clara)

Wells

Morton

Long



2. Give the approximate date of the beginning of each of the following:
  - (a) improved conditions of nursing
  - (b) sterilization of wounds
  - (c) use of anesthesia
  - (d) ligature

**Discussion:**

1. Name some of the factors that were necessary for the development of modern surgical skill.
1. "Loving hands may transmit the disease." What does this mean? Give an instance (imaginary).
3. To whom would you award the honor of being the discoverer of the use of anesthesia? Why?
4. Compare the careers of Florence Nightingale and Clara Barton.
5. "Clean hands may carry the disease." Explain how this may be possible.
6. Name some common antiseptics. Discuss their use.

**Health Habit Formation:**

1. Make a list of the modern health practices that are suggested by a reading of this chapter.
2. In particular, what methods used by Paré in the sixteenth century would be acceptable today?

## VII. HEALTH AND SCIENCE TODAY

### Frauds and Quacks:

By a "quack" we mean one who pretends to have skill which he really does not have, particularly in medicine. "Quackery" is a term often used to describe the practice of medicine by people who are ignorant of real medical knowledge. The American Medical Association has published volumes and books describing the frauds and deceptions in medicine practiced upon the people of the United States.

Frauds and "fakes" in medicine have been practiced on people for centuries. It must be remembered that the nature of the real cause of disease (germs) was not known until about fifty years ago. Before that time all sorts of theories and remedies were practiced. The most peculiar theories, treatments, and devices were tried, particularly during the Middle Ages, which was an era of superstition along many lines. When the truth is known and practiced, superstition disappears.

Hippocrates believed in natural measures for the cure of disease—diet, fresh air, sunshine, and few, not many, drugs and medicines. Later Greek physicians tried to improve on Hippocrates by originating many wild and untrue theories for the cure of disease. When Greek medicine spread to Egypt the influence of the Egyptians caused the use

rugs (mostly taken from herbs or plants) to be added to the practice of Greek medicine. Galen, the great Greek physician who lived in Rome during the second century, A.D., was in large measure mistaken in many of his ideas although he was better known and probably had more influence than any other Greek physician.

The great influence of Galen was due to the fact that he wrote many books on medicine. In this way he achieved for himself what we now call publicity. His views and his writings were known and followed for over a thousand years after his death. In his books he set forth many absurd theories and remedies. He prescribed the use of hundreds of drugs or medicines, all based on ignorance and mistaken ideas. This use of drugs and herbs as "cures" still persists today. Modern medicine has discovered that only a few drugs are of any great value, and that these must be used in a very exact way. The medieval attitude which looked upon drugs and strange substances as cures for nearly everything has been replaced by an emphasis on meeting the natural needs of the body through fresh air, sunshine, diet, exercise, and rest, with the use of drugs as "aids" in the process of natural recovery, rather than as "cures."

### **Patent Medicines and Devices:**

Sometimes "patent" medicines are called "pro-



### HAIR UNDERNOURISHED?

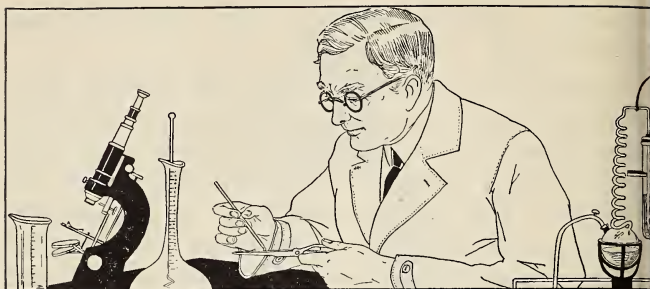
*Hairs were taken from this head and cut into small pieces, then were mailed to a "quack" scalp and hair specialist. In his reply he advised treatment as, according to HIS microscope, the hair was in a "seriously undernourished" condition.*

prietary" medicines. That is, they are made and owned by private individuals. The use of these patent medicines is based in large measure upon the same principles that caused the wide acceptance of Galen's erroneous ideas: first, the ignorance of the people, second, "publicity," and finally the desire of the sick to try anything in order to get well. This applies equally as well to the man who advertises mechanical devices for the care or treatment of bodily ills or undesirable conditions. One should be cautious about investing money in any patented appliance unless it is recommended by a reputable

physician, especially one who will not profit from the sale of it.

It must be remembered that the purpose of a privately owned patent medicine is essentially to make money. True discoveries should be made public and free for the use of all in order to benefit mankind. The highest standards of the medical profession require that discoveries of beneficial treatments and cures should be given to the world and not kept hidden for private use in order to make money. This can best be illustrated by the discoveries of many men. A recent instance is the discovery of the beneficial use of insulin in the treatment of diabetes by three Canadian physicians and scientists named Banting, Best, and MacLeod in 1921. They first made sure of their discovery, then gave it freely to the world. No attempt was made to keep it for themselves or to make money from it. With them the welfare of the human race came before any desire for wealth. This indeed is the true spirit of the scientist and of the physician.

Another instance of the unselfish spirit of the real scientist may be found in the life of Pasteur. It has been estimated by Thomas H. Huxley, a great English scientist, that the money value of the discoveries of Pasteur would amount to enough to cover the entire war indemnity paid by France to Germany in 1870, five billion francs or one billion



### THE SCIENTIST

*Modern medicine uses the exact methods of science. Pasteur who revolutionized modern medicine was a scientist. Scientists are seeking everywhere to improve our knowledge and control of health.*

dollars. This amount would have increased many times since that estimate was made many years ago. Pasteur, however, chose to remain poor and to set an example of simplicity. Such a spirit of self-sacrifice has been typical of the real benefactors of mankind throughout the ages; not "How much can I make?" but "How great a service can I render the world?" We may therefore be suspicious of privately owned or patented medicines. Certain preparations may be of value, but they should be taken only when recommended by a physician. Most physicians, however, will give a prescription to be filled, which will probably cost less and serve the same purpose.



Testimonials are frequently published as advertisements for patent medicines. Generally, these are in the form of letters written by people who tell of the great improvement in their health after having taken the medicine advertised. Investigation has shown that many of the people have died shortly after of the disease for which the medicine was taken. The temporary improvement in their health may be due to either of two things—faith that the new medicine will help them or else a stimulant which it contains—either of which will make the patient feel better for a short time. In some cases, the announcement of the patient's death has appeared in the death notices on one page of a newspaper, while on another page of the same newspaper appears a testimonial for the patent medicine written previously by the person who is now dead.

### **‘Rounding Up the Quacks’:**

The following editorial is quoted because it shows not only to what extent harm is done by unscrupulous people who pose as doctors, but because it also shows how proper state legislation and enforcement may serve to prevent such harm to innocent people:

#### **ROUNDING UP THE QUACKS**

“Twelve arrests of persons charged with the practice of medicine and surgery without a license are the first fruits

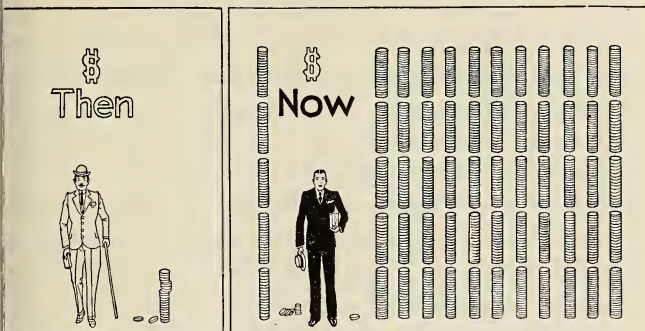
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\*From the Philadelphia Public Ledger of July 19, 1930, by permission.

in this city of an investigation by the State Board of Medical Education and Licensure. For the protection of the public the laws of Pennsylvania require that every medical practitioner shall be specially trained for the work and that licenses to practice shall only be given after the applicant has passed a rigid examination to test his efficiency. Notwithstanding this, the community is infested with persons without these qualifications who prey upon the credulity of that element of the public which is most in need of protection. Their operations are a reflection upon the medical profession; but worse than that, their victims are robbed and all legitimate efforts for the cure or prevention of disease are seriously handicapped. For the bogus practitioners arouse false hopes in their clients and too often delay those preventive measures which might save them from suffering and misery.

"There is ample machinery of law to deal with this evil and the State authorities should have the full support of the local health board and of the County Medical Society in their campaign to rid the city of every person who falsely masquerades under the name of "doctor" and who extorts money from his victims for "treatments" based on deliberate chicanery or gross ignorance."

Most frauds and quacks do not possess a certificate of graduation from a medical school of recognized standing. They either have no certificate or diploma at all, or else have one from some school or college of inferior rank, closely approaching their own level as frauds. It should be noted, however, that occasionally there is a "black sheep" or unethical practitioner among the graduates of legi-



### COST OF PREPARATION FOR THE MEDICAL PROFESSION

*This shows the greatly increased cost of preparation for the medical profession. Medical students must go through a long and expensive course of education. It is much more thorough, and we get a better doctor from the process.*

imate medical schools. Such exceptions are comparatively rare, however. Graduates of reputable schools do not need to stoop to fraud and quackery.

### Self-Diagnosis:

Many people take patent medicines in order to save the expense of a doctor. This is not only false economy but very dangerous as well. Many patent medicines contain drugs which may be injurious to the health of the particular person. Examination by a physician would result in the avoidance of any drug which might be harmful.

Another possible ill effect of the taking of patent-

medicines without the advice of a physician lies in the fact that the person who is ill must decide from his own symptoms what ails him. People without medical training are in no position to do this and often make serious errors. For instance, "pains in the back" do not mean "kidney disease." So-called kidney disease is often painless; its symptoms are of a different nature. Self-diagnosis is dangerous. The diagnosis of disease should be left to the experience and training of a skilled physician.

Frequently people who decide on their own symptoms and their own medicine err in their judgment and not only take medicine which does them no good, but if they have anything serious the matter with them, they are also missing the right treatment. The postponement of correct treatment very often results much more gravely than if proper treatment were given immediately. One of the most important factors in the successful treatment of disease is *early recognition*. Delay due to an error in judgment may result seriously.

Self-diagnosis and medication is poor economy because the money spent on the patent medicine is not only frequently wasted, but more money may have to be spent in the long run because of the delay in seeking the services of a physician. Prompt attention by a doctor in the beginning is generally the best form of economy.

Many patent medicines are absolute frauds

They may contain "iron" or "vitamins" or other properties as advertised, but they may be present in such negligible quantities that they are of little value. Such substances are frequently found in more helpful form and quantity in ordinary food. If such elements are advisable, your doctor's prescription can supply what you need in the proper quantities. Do not be misled by stories of friends who were "cured" by certain patent medicines. Many such cures may be accounted for by the fact that the people concerned would have improved anyway. In other cases, the mere belief that it would help may have resulted in the improvement, or seeming improvement.

### **Mental Attitudes:**

It has long been known that the state of one's mind has a great deal to do with one's health. The stomach and the heart may be affected by mental strain or worry. The patient who is optimistic, cheerful, and courageous generally has a much better chance to recover than one in similar circumstances whose mental attitude is pessimistic and depressed.

Men in battle, under great excitement, may not feel the sting of a bullet until some time after they have been hit. We read stories of the mutilations inflicted by uncivilized or backward races upon their own bodies to show their religious zeal or



faith. They apparently felt no pain. In such cases the body seems to be so completely under the control of the mind that there is no sensation of pain. At least it does not seem to penetrate into consciousness.

There are evidences of the curative value of the mental attitude of the patient. Faith in the doctor has no doubt helped many along the road to recovery. We have all heard of the patient who complained of being sick and in whom the doctor could find no symptoms of illness. However, being a wise doctor and knowing his patient, it is related that he left some pills which the patient thought contained medicine, but which actually had no curative value in them; in fact, they were merely sugar pills. The patient took the pills and was "cured." Of course, he was not ill to begin with, but he thought he was, and the doctor merely took the best way out of the situation. Faith in the doctor was particularly strong some years back, and it still exists today where the same physician has served an entire family, young and old, for all kinds of illnesses over a period of years.

It is probable that faith has helped to cure many people in all periods of time—the belief of the savage in his witch doctor or medicine man, and of the peoples of the Middle Ages in many of their outlandish concoctions which had no medical value, and by the faith of many people of today who de-



pend on will and the spirit rather than medicine to heal their ills. It must be admitted that there is some good in these mental attitudes in certain cases of illness.

A few years ago a French druggist named Coué (Koo-āy) attracted world-wide attention by the numerous reports of cures made through his use of faith. He had his patients repeat regularly, "Day by day in every way I am growing better and better." The effect of constant repetition of this idea is to believe it. Thousands of cures were reported seemingly due to this power over one's self. Yet the fad has died out. Although it was only a few years ago, the name of Coué is almost forgotten. Coué himself died while his fad was still in vogue!

There are probably certain limits beyond which faith should not be carried. The faith of the peoples of the Middle Ages did not stop the great plagues of contagious diseases—the black death, smallpox, cholera, and others. But modern science in civilized countries has stopped them. Modern medicine, moreover, recognizes the value of faith and optimism in the patient and seeks to cultivate these qualities as aids in the cure of disease. It is well for us to avail ourselves of the discoveries and of the knowledge of modern science and medicine where it is possible to do so.

### **Other Types of Healing:**

There are numerous theories and types of treat-

ment for the sick. Many of them are new. Many will last a short time, then disappear, like the type of mental healing advocated by Coué. Coué, however, made in a certain way a definite contribution toward health. He emphasized the value of optimism, faith, and cheerfulness in the cure of disease.

Modern medicine accepts the good from whatever field it may come, provided there is some definite assurance that the good is there. Osteopathy and chiropractic are two types of treatment that have received considerable patronage during the past decade or two. By osteopathy is meant the treatment of diseases without the aid of instruments or drugs. Osteopathic treatments consist largely in the massaging or manipulating of bones, ligaments, cartilage, or muscles in order to stimulate bodily functions, relieve pressure on nerves, or to replace bones that may be slightly out of position. Osteopathy believes that such are the causes of disease. Chiropractic (kī-rō-prāk-tic) is somewhat similar to osteopathy. Its method of treatment of disease is based upon the manipulation of the spinal column. Neither osteopathy nor chiropractic are cures for anything. They are merely forms of treatment without the aid of drugs.

Here again, common sense and reason should put us in the middle ground. That is, it seems foolish

to depend upon such theories for the treatment of everything when we consider the wonderful discoveries that science has placed at the disposal of modern medicine. On the other hand, it seems equally foolish to assume that no good can come from them at all. Many people seem to have been benefited by such treatments, particularly as a means of more complete use of muscles, bones, and joints, in cases of recovery from accidents and, in some cases, disease. Many physicians acknowledge their value. Such schools of treatment are also wholesome influences against too great dependence on drugs and medicines as a cure for everything.

One distinction should be made, however. In most states, the qualifications for the practice of medicine are high. A long course of training and study is necessary, generally from two to four years at college, four years of intensive medical school training, and then one to two years of service as "intern" in a hospital. All the lessons learned by science and medicine through the ages are at their disposal. Many physicians take post-graduate study after that, either at some university here or abroad. Such a course of training tends to be selective, that is, it is long, expensive, and so difficult that only intelligent men of good character will be able to endure, persist, and survive. There are some exceptions, of course, but in the main we may respect the average physician today as being the

product of good, even severe, training. The course of preparation he has taken is a recommendation of his character and ability.

On the other hand, the newer and unrecognized types of "schools" are not so well established. They do not have the great facilities for the preparation of their students as do the medical schools of our great universities. There is not so much to study. The knowledge given is narrow in its field and more limited in amount than that given in a standard school of medicine. The course of training is brief and not severe. It is possible for one who practices osteopathy or chiropractic to study and graduate in a very short time. While no reflection is intended on the many good men who practice these forms of treatment, the short period of preparation required enables men of less education, and sometimes of doubtful character, to complete the course. The limited amount of education and of medical knowledge possessed by many graduates of such schools makes them *as a class* less preferable than the graduates of recognized schools of medicine, for matters of general diagnosis. Many people prefer to go to a family physician or general practitioner first, and then later consult specialists in a particular field of treatment if it is necessary or advisable. It is better not to rely on these forms of practice as panaceas, but rather to think of them as of possible value for certain kinds of treatment.

## **The Best Policy:**

It is well to be open-minded in regard to matters of health. The past should teach us not to be too quick to condemn innovations and discoveries. On the other hand, the past should also teach us not to be carried away with too great enthusiasm for something that is new, and possibly only a passing fad.

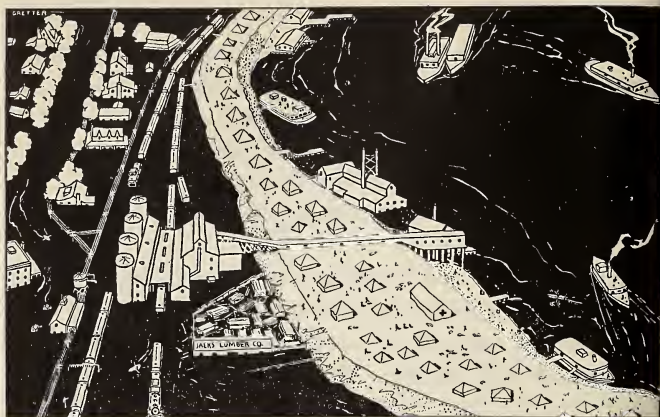
In particular we should be on guard against the wrong thinking that is involved in accepting a certain kind of treatment because a few persons were so treated and cured. It is possible that the patient would have recovered anyway. We should not draw hasty conclusions from limited experience or observation. Individuals vary; what has helped one may not be so beneficial to another.

Nor should we place too much faith in any one thing or in one person. In case of doubt of a serious or of a continued illness, the opinion of several doctors and of specialists should be sought. Reliable physicians who are not making progress with a case or who are puzzled by symptoms will often suggest a consultation of several physicians.

## **Modern Medicine:**

Modern medicine should command our respect because it uses the exact methods of science. It experiments, it tries out, and finally verifies its conclusions. The experiments and the methods of





### A FLOOD

*The "Father of Waters" overflows the banks. Whenever a calamity—storm, earthquake, or flood—takes place, doctors and nurses are rushed immediately to the scene to install sanitary measures and to prevent the outbreak of disease epidemics. Modern medicine is preventive medicine.*

Pasteur illustrate splendidly the use of the scientific method and its application to the field of health. Thus, modern medicine is entitled to our respect and consideration.

Furthermore, modern medicine is open-minded, as the nature of scientific investigation requires. It will take from any field a contribution to the field of health and healing. It accepts the value of a correct mental attitude—optimism and faith—on the part of the patient. It also accepts the value



of massage and other types of treatment for cases in which such treatment has been found to be beneficial. It does not emphasize too great reliance on medicine and drugs, but tries in their judicious use to assist and strengthen the natural forces of the body to effect a cure, with the aid of fresh air, sunlight, proper diet, and rest.

### **Preventive Medicine:**

Although modern methods of treating the sick are great improvements over those of preceding years and centuries, the great contribution of modern medicine is in the prevention of disease. The preventive measures of modern medicine have practically eliminated the great and deadly epidemics of other generations. They keep out the bubonic plague, have practically eliminated leprosy and cholera, and have greatly reduced the number of cases of smallpox, diphtheria, and the many contagious diseases of children.

If it were not for the various kinds of quarantine and other public health regulations, together with vaccination, inoculation, and the taking of "cultures" from suspects, it is probable that these United States and other civilized countries would be swept by great waves of disease and death. The influenza epidemic which occurred toward the close of the World War illustrates how terrible such pestilences can be, yet the influenza epidemic was

mild compared to those of other kinds from which the world has suffered in the past. The influenza epidemic was partly due to the breakdown in sanitary regulations and safeguards caused by the World War, and partly due to the fact that influenza was not thoroughly understood. Scientists are still working on this problem. It is interesting to note that epidemics of disease generally follow wars or originate in them, and it is of further interest to note that the most of these great enemies of man originate in or near Asia.

Modern science and medicine are in a sense great and ever-vigilant sentinels standing on guard against the beginnings of disease epidemics. The health regulations they lay down are the direct means of maintaining the public health. These regulations are sometimes of personal inconvenience to us, but as good citizens it is our duty to coöperate fully in carrying out the letter and the spirit of such requirements. Furthermore, each of us should endeavor to assist in the maintenance of his own individual health by proper immunization through vaccination or inoculation, whenever these measures are recommended by reputable physicians.

### Deficiency Diseases:

Not all diseases are of infectious, or germ, origin. Some come from the weakness or the wearing out of organs within our body. Others, whose origins

have only recently been discovered, are caused by the lack of a supply of some important element within the body. This deficiency generally occurs in either of two important ways: the missing element or substance may be one which is normally supplied by some organ or gland within the body, or it may be an element which is ordinarily found in the food supply of the body and which has been omitted from the diet. In each case science has made recent discoveries regarding the nature of some of the elements, and has found means of checking the disease by supplying the missing element. In this respect modern medicine is again placing less emphasis on the use of drugs, used so plentifully in the Middle Ages and in ancient times, and instead is endeavoring to see that the natural needs of the body are adequately supplied.

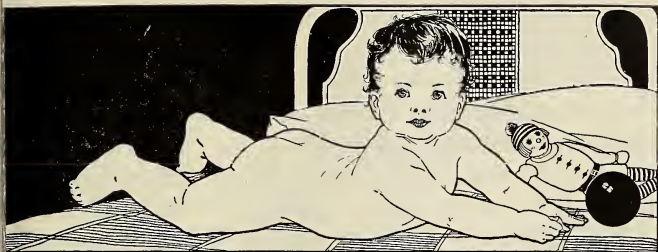
It has been found that one important substance created by the thyroid gland in the neck can only be produced when iodine is present. When iodine is absent from the food supply, or present in insufficient quantities, the thyroid gland cannot produce this important substance, and there is serious interference with the growth of the body. A form of mental backwardness frequently results. If iodine is added to the diet an improvement in physical growth and mental development results. Iodine is present in the salt of the sea, the salt air, and food products from the sea. People living far in-

land are those most likely to receive an insufficient supply of iodine because the iodine content in the soil and the drinking water has been exhausted.

Another type of deficiency disease is called "diabetes." It is caused by an insufficient supply of insulin, a substance secreted and distributed by the pancreas, a gland located just behind the stomach. When the pancreas fails to perform its functions properly, diabetes results. Insulin can now be given to the body in sufficient quantities so that the symptoms of diabetes disappear or at least are held in check. The discovery of the value and place of insulin resulted in improved treatment for this disease.

In the old days of sailing vessels, when it was impossible to keep sufficient fresh food, particularly vegetables and fruits, on board ship to last for a long trip, sailors frequently suffered from a disease called "scurvy." It was discovered that this could be cured by feeding the men fresh or raw vegetables or fresh fruits. The record of the voyage of Vasco da Gama around the Cape of Good Hope to India tells of the appearance of this disease and of how it disappeared after the men had eaten oranges. The significance of this example of cause and effect was not recognized at that time, however.

Another deficiency disease is "rickets." It occurs chiefly in children and is due to a lack of either



*Plenty of Vitamin D for*

- 1. Well-formed legs*
- 2. Robust chest*
- 3. Strong jaws*
- 4. Sound teeth, well placed*
- 5. A well-shaped head*

sufficient sunlight or of certain food elements. It can be prevented or cured by the introduction of increased exposure to sunlight, either natural or artificial, or by the use of cod-liver oil which contains a substance (vitamin D) closely related to sunlight in its properties and value to the body. It has been found also that pernicious anemia, a disease associated with a loss or diminution in the number of the red corpuscles, can at times be partly overcome by the addition of liver to the diet. Other forms of anemia are often improved by the taking of iron in some form.

“Beri-beri,” a deadly disease of the nervous system, was prevalent largely among people in India whose diet was composed almost entirely of pol-



ished rice, that is, rice without the hulls. It was found that those who ate the whole rice did not develop the disease. There was something in the hull that the human body required. Without it, a deficiency disease developed.

Another deficiency disease found in certain parts of the United States is "pellagra." It is caused by a lack of certain protective vitamins found in milk, eggs, and certain kinds of fresh meats. The people who have pellagra develop it because they have relied too much on a diet of corn meal, hominy, pork, and cane syrup. The adding of milk, eggs, yeast, and certain fresh meats to the diet causes the disease to disappear.

Cretinism, diabetes, scurvy, rickets, anemia, pernicious anemia, beri-beri, and pellagra are some of the "deficiency" diseases with which modern science and medicine have learned to cope successfully. As far as food is concerned, they give increased emphasis to the value of a balanced diet.

### Vitamins:

Some of the most notable discoveries in the field of health during recent years have been related to a study of the nature and influence of vitamins. You have no doubt studied something about them in connection with food, nutrition, or metabolism in the lower grades. In order that they may be given sufficient treatment of an advanced type, they are





### PHOEBUS APOLLO

*The sun god of the ancient Greeks about to start his fiery chariot across the heavens. The Greeks, too, knew the value of the sun for life and health.*

discussed elsewhere in this book as a special topic in a separate chapter. It is sufficient to note here that vitamins are protective substances whose exact nature is unknown, but which tend to prevent the development of growth disorders or of deficiency diseases. Further details may be found on pages 188-190.

### Heliotherapy:

(Helio, sun; therapy, treatment—in other words, sun treatments or sun baths). We have already discussed the regard in which the ancients held the sun. Science today holds the sun to be all important. It is in truth the source of all life and

activity. The two beliefs—modern science and ancient superstition—thus closely approach each other in their recognition of the importance of the sun.

Modern physicians have long recognized the curative value of the sun's rays. It must be understood that what we call sunlight or light is in reality made up of a number of invisible rays of different colors, contradictory as that may seem. These rays can be seen by taking a prism of glass (such as used to hang from old-fashioned, and now ultra-modern, chandeliers) and permitting sunlight to shine through it upon the wall. The colors of the rainbow appear. They are the colors of the various rays of light, and the rainbow itself is also a like revelation caused by certain conditions in the atmosphere. These colored rays go from red at one end to violet at the other. In addition there are certain invisible rays at each end of the spectrum (stripe of colors). Just beyond the red at one end are the "infra-red" and just beyond the violet at the other end are the "ultra-violet." While these rays are invisible, they are very powerful.

The different rays of the sun have certain properties, which they possess in varying degrees. These properties are heat (thermal) and chemical (actinic). Heat is weakest at the violet end of the spectrum and becomes strongest at the red end and just beyond. The chemical or actinic property is weakest at the red end of the spectrum, and



## THE SPECTRUM

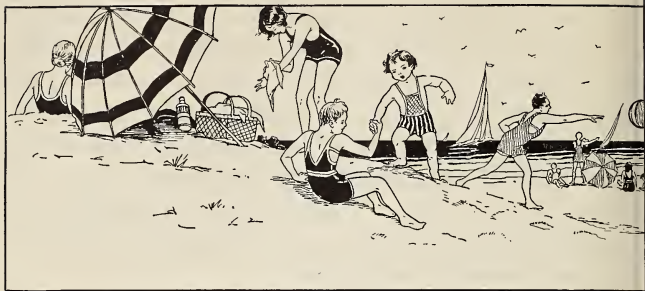
*Here we have the various rays of the sun as they appear in the rainbow, or when split up by passing through a prism of glass. The ultra-violet rays are invisible, just beyond the violet rays. The infra-red rays are also invisible just beyond the red rays.*

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becomes increasingly stronger toward the violet end and is strongest in the invisible ultra-violet rays, X-rays, and beyond. The infra-red rays (thermal or heat rays) are also known as "deep" rays. That is, they have the ability to penetrate beneath the skin and affect tissue lying below the surface of the body. These rays are believed to be beneficial in the treatment of certain conditions of bones, muscles, and joints.

The ultra-violet rays are stronger in chemical (actinic) action and weaker in thermal or heat properties. They are known as "short rays," that is, they do not penetrate much below the surface of the body. Their action seems to be confined to the dermis, or true skin. These rays, and not the heat rays, are the principal cause of sunburn. They also cause "snow-blindness," the result of the reflection of the ultra-violet rays from the surface of the snow. The eyes, being on the surface of the body, are very sensitive to the effects of ultra-violet rays and should be carefully protected from them. One value of the actinic or chemical property of the ultra-violet rays seems to lie in their ability to build up our resistance to disease, particularly diseases of the respiratory tract like colds, influenza, and pneumonia.

Precisely how this is accomplished is not known, but one theory is that what happens is similar to that which takes place in an inoculation or vac-



### SUN BATHS

*Good for all ages. Unwise exposure, however, will result in a bad case of sunburn, or sun poisoning*

cination. It is thought that the actinic action of the ultra-violet rays causes a poison to be generated in the body, which in turn produces antibodies of artificial immunity in the blood stream. This theory seems to be borne out by cases of sun-poisoning caused by an overdose of sunburn. It is possible that the chemical action of the ultra-violet rays kills cells in the true skin (indicated perhaps by the way the old skin peels off) and that the poison is produced in this way. It is also thought that it is the chemical action in the ultra-violet rays (and other rays too perhaps) that kills disease germs. Sunlight kills germs. We also know that sunlight or the ultra-violet rays help to produce vitamin D, the bone-building vitamin, in the body. (See pages 191-198.) The benefit is therefore twofold.



Physicians and scientists are not sure of all of the possible effects of the sun's rays upon the human body. They therefore urge caution in the use of sun-lamps, thermal heat lamps, and ultra-violet ray lamps that are advertised. It is possible that under certain conditions or diseases, the use of such a lamp might be harmful. These lamps are not panaceas or cure-alls. They are good for certain things, and in limited amounts. Again the possible ill effects of self-diagnosis are emphasized. You should consult your physician before using any therapeutic device. Even natural sunlight may be harmful and dangerous under certain conditions.

Few ultra-violet rays penetrate ordinary window glass. Therefore, an enclosed sun-porch does not receive much of the beneficial effect of the ultra-violet rays, although it does receive the warmth of the heat rays. An attempt has been made to manufacture special kinds of glass that will more freely permit the passage of ultra-violet rays, but without a great deal of success. The best type of this kind of glass is expensive and not as effective as the direct rays of the sun itself. It is reported that even such glass gradually loses its effectiveness.

Ultra-violet rays do not penetrate clothing very effectively. This can be seen by the marks left by clothing or bathing suits. The mark where the sunburn ends is clearly shown where the covering

of clothing begins. From the standpoint of health at least, the tendency of recent years to expose as much of the skin as possible to summer sun is beneficial, provided the skin is permitted to accustom itself gradually to the sun.

A great deal of attention is being given today to the so-called smoke nuisance. In fact, most of our large cities have ordinances that are designed to control this evil. Smoke and soot not only soiled clothing and the skin of the body, but the fine particles suspended in them effectively block many of the valuable sun rays and thereby deprive the body of these healthful agents.

### **The Endocrine Glands:**

These glands are sometimes known as the "ductless glands" or the glands of internal secretion because they manufacture certain substances which enter the blood stream. They influence normal health, growth, and development of the body. They are discussed in detail as a Special Topic, Chapter IX, pages 262-275. The endocrine glands are mentioned at this time, however, because it should be borne in mind that a knowledge of their nature and function is one of the products of modern medical science.

### **Mental Hygiene:**

Emphasis on mental hygiene is a comparatively



### GOOD MENTAL HYGIENE

*A. Adequate care for one's own health.*

*B. Service to others. "Jane Addams of Hull House" has become a tradition of American life, having given over forty years of work to social betterment.*

Recent development. In earlier days, insanity was believed to be the result of demons or evil spirits taking possession of the body. Humane and considerate care for the insane has made much progress during modern times, but much is still to be done in the way of improvement for the protection of society and the comfort and relief of the mentally unbalanced.

Much attention has been devoted to studying the complex and difficult problem of determining the causes of nervous disorders and abnormal conditions of the mind. Some of these conditions are often due to physical causes, the results of diseases

that attack the nervous system or the brain itself. It must be remembered that the mind is not merely the product of the brain (a view formerly held). Anything that happens to the body is reflected in some way in the brain. It is the seat of consciousness for the whole body. This means that if we desire normal mental processes and mental health we must practice the rules of hygienic living for the whole body. By good physical living, the best interest of good mental life are served. "A sound mind in a sound body," the ancients expressed it.

There are certain rules, however, that relate especially to the care of the nervous system itself with particular reference to the brain as the center of the nervous system. These rules have been carefully discussed in connection with the hygiene of the nervous system. Many of the principles of good mental living concern themselves with the elimination of selfishness from our ideals of life. Rudyard Kipling expresses this very well in his capital story of Bimi by using the phrase "too much ego in his cosmos."

By "selfishness," as we use the word here, we refer not merely to outward acts but to thinking and to ideals—too much thinking of self and of one's own narrow interests. Much unhappiness comes from defeated hopes and plans that center about ourselves. The solution for unhappiness and the elimination of worry lies along the path of

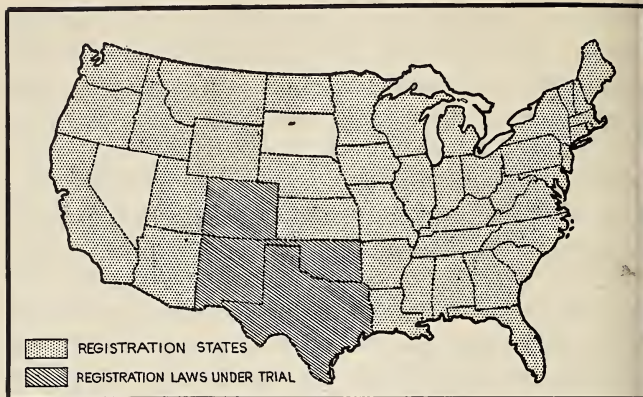
wholesome activity in the promotion of the welfare and of the happiness of others. The lives of the truly great men and women of all times and ages reflect this spirit. Such people have lived contented and peaceful mental lives in the face of physical hardship and suffering. Their first thought has been of others', rather than of their own welfare. Adequate care of one's own health fits into such a program, for by this means we increase and prolong the possible usefulness of our lives to others. Hygienic living is a true part of the life of one who devotes himself to the service and happiness of others.

### **Vital Statistics:**

The expression "vital statistics" is used to refer to the study of births and deaths, and of diseases in large groups of people. The use of vital statistics as an aid to health is one of the features of modern life. By means of such statistics investigations may be made and results compared. It is one form of the application of scientific method to problems of health.

Practically all civilized countries maintain offices or branches of the government that concern themselves with vital statistics. The results enable them to study and to provide for the health of the people. They are also enabled to compare the various health conditions in their own country with





### HOW VITAL STATISTICS ARE COLLECTED

*The exact death rate of the United States is unknown because there are a few states in which the methods for reporting deaths are not regarded as adequate. The state reporting at least ninety per cent of the births and deaths are regarded by the United States Census Bureau as comprising respectively the U. S. Death Registration Area and the Birth Registration Area. Vital statistics for the United States are calculated on the basis of these areas*

the health conditions in other countries. For instance, we know that the people of New Zealand attained an average length of life of almost sixty-five years, according to their own statistics, while the average length of life in the United States in 1920 was about fifty-five years. In other words the difference in the average length of life between the two countries was about ten years. Why that



difference? Who knows? Thus, further health investigation and discussion is stimulated. Great aid is given to the study of particular diseases by comparing the statistics of various countries, or sometimes by comparing the figures of different parts of the same country.

In our own country there are many agencies at work compiling and studying statistics covering many different aspects of health problems. There are various offices of the National Government, the Bureau of the Census in particular, which assembles, studies, and compares vital statistics. Investigations are made from time to time by the United States Public Health Service of the Treasury Department, the Department of Agriculture, the Department of Labor, and others. Many states maintain their own offices for the assembling and study of vital statistics and related health problems. Generally, this is under the supervision of the State Board of Health. Cities, towns, and country districts through their own local Boards of Health, or similar bodies, make contributions to the study of health problems. Local and state regulations require the reporting of certain types of communicable diseases, as well as all births and deaths. Life insurance companies through a study of the answers made to questions by applicants for life insurance make very valuable contributions to the study of special problems in health as they concern

large groups of people. The results of these studies are published from time to time under the following (or similar) headings: "Decrease in the Death Rate," "Gain in Expectation of Life at the Age of Ten," "Saving Wage Earners' Lives," "Mortality of Children," "Tuberculosis," and other headings. Private, semi-private, and public health organizations also contribute special studies of conditions.

Answering questions and making out reports no doubt inconvenience many people and sometimes seem to be a violation of our private affairs, but we should bear in mind that in most cases there is no particular interest in the answers of one individual. The benefit comes from the use of these questions and answers in studying the health conditions that exist in large groups of people. By answering these questions accurately, we can be of much assistance in this very necessary phase of health work, the study of vital statistics.

### Meaning of Birth-Rate and Death-Rate:

The principal forms of vital statistics concern the number of births and the number of deaths. The births and the deaths are averaged on each 1000 of the total population. These averages are known respectively as the *birth-rate* and the *death-rate*. Thus if a population of one million people had 20,400 births during the year, the birth-rate would be 20.4, or about 20 for every 1000 people.

The death-rate is calculated in the same way. If a country, or a city or a state, of one million people had 14,700 deaths during the year, the death-rate would be expressed as 14.7 (per thousand being understood).

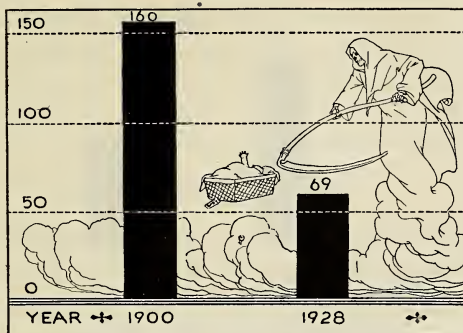
The ordinary death-rate is a "crude" death-rate. By that we mean the figure represents the number of deaths that *happen* in a given community. Thus, a health resort might have a high "crude" death-rate, because so many sick people who are not really residents go there for their health. Such figures would not represent the true health conditions in the real community, which might by reason of location or climate be a healthy place. Consequently, deaths in hospitals and other places for the treatment of the sick should be credited to their original place of residence, rather than to the community in which the patient happened to lie. While this means much extra clerical work, many states do reclassify deaths according to place of original residence. This gives what is known as a "corrected" death-rate.

Still another adjustment or correction is necessary in order to compare fairly the health conditions in any two given communities. One may have fewer young people and many more older people in proportion to the total population than the other with which its death-rate may be compared. Often the young people will move to a neighboring

city from a near by country town. The death-rate in a community consisting largely of older people would tend to be higher than in a community with a normal distribution of the various ages. Such a death-rate also would not give a true picture of the real health conditions of that community. Consequently the death-rate is often further adjusted on the basis of what it would be if there were a normal distribution of the population, not only by age but by sex as well. This is called an "adjusted" death-rate. In drawing conclusions from, or making comparisons of death-rates, therefore, we should make sure in each case whether the crude death-rate, the corrected death-rate, or the adjusted death-rate is used.

The general death-rate (that is, the total from all causes) whether it be crude, corrected, or adjusted is always expressed as the number of deaths per thousand of population in a year's time, unless some other period of time is particularly designated. But death-rates from specific causes (like typhoid, diphtheria, heart-disease, tuberculosis, etc.) are generally based on the number of *deaths from that cause* in every 100,000 of population.

The death-rate of babies, known as the infant mortality rate, is based on the number of deaths of infants under one year of age in the course of a year, for every 1,000 of live births during the same year. In 1900, the infant mortality rate for



*Comparison of Infant Mortality Rates*

*What does this chart show?*

*What explanations can you give?*

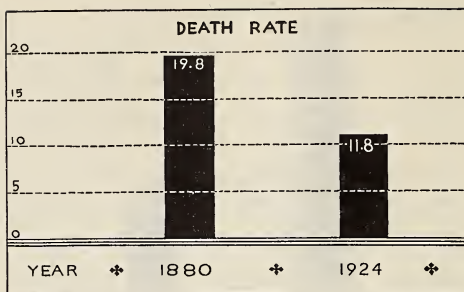
The United States was approximately 160. In 1928, it was 69.

The number of cases of illness caused by a particular disease is generally referred to as the case-rate, the illness-rate, or the morbidity rate.

### **Declines in Birth-Rates and Death-Rates:**

During recent years the birth-rates in many countries of advanced civilization have been falling. The extent to which various causes may be responsible for this is a matter of conjecture. There has also been a marked decrease in the death-rate during the past fifty years. This is probably due in part to the great discoveries of Pasteur, Koch, Lister, and others, which resulted in improved sanitation.





### *Comparison of Death-Rates*

*Explain this chart. What does it mean? What explanation can you give?*

tion and improved methods of treatment of the sick. It is probable also that improved standards of living have helped to decrease the death-rate in many civilized countries. The death-rate in the United States fell from 19.8 in 1880 to 11.8 in 1924, a decline of over 40%.

Other countries have also experienced a decline in their death-rates. This has resulted in people living longer, and in correspondingly greater increases in the population. These increases in population have brought with them new problems to be solved. The great plagues and epidemics of past centuries, together with constant and ruthless warfare, kept the populations of the various countries down in numbers. Now many countries find themselves faced with the task of caring for more people.



ple than they can comfortably accommodate. As a result, difficult economic and political questions have arisen in various countries. In some cases competition occurs with other nations for foreign possessions which offer opportunities for providing for the needs of their own people.

### **Life Expectancy:**

The decrease in the death-rate does not necessarily mean that more people live to an extreme old age than formerly. The increased life span has been given to youth, to children, and to babies. Perhaps we might say that all under fifty years of age have a better chance of living longer than they had a generation or two ago. Improved practice in the prevention and treatment of illness, as well as improvement in living conditions, has saved the lives that formerly were lost through ignorance and helplessness. The average child or youth may expect to live longer in these days than the average child or youth of the same age fifty years ago. We call this increase "expectancy of life" or "life expectancy." One's life expectancy depends on his age, sex, and physical condition. As one grows older, the life expectancy grows shorter.

The following table shows the increased expectancy of life, at various ages, for people living in the year 1925 over those of the same ages living in 1850. The intervening seventy-five years cover

the time during which occurred the great improvements in nursing and surgery, and the great reforms in medicine and sanitation brought about by Pasteur and others.

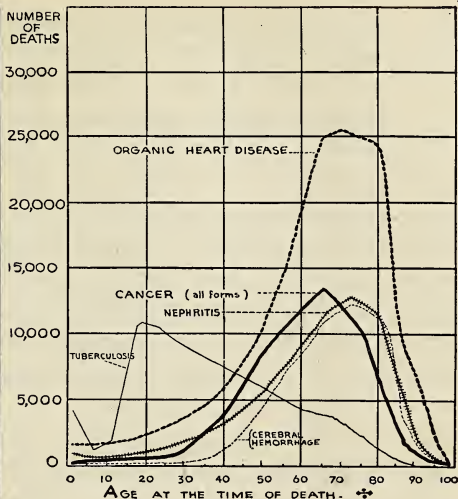
### TABLE

#### LIFE EXPECTANCY 1850-1925

	Additional years of life expectancy
At birth .....	20 years (more)
At 10 years of age .....	8 years (more)
At 20 years of age .....	6 years (more)
At 40 years of age .....	1 year (more)
At 60 years of age .....	1 year LESS

It will be noted that the last line shows that a person of sixty years of age in 1925 has a life expectancy of one year LESS than the average person of the same age in 1850. One explanation for this may be that the person who lived to be sixty years of age in 1850 was an unusually hardy person, disease having carried off the weaker ones.

Figures showing life expectancy at various ages also varying according to sex and other conditions are important phases of the work of life insurance companies. Insurance rates and policies are based on vital statistics of this sort. Statisticians who work out these figures of life expectancy for insurance companies are known as actuaries, and the tables of figures which they prepare concerning vital statistics are generally referred to as actuarial tables.



### CAUSES OF DEATH

*This chart shows for the year 1925 the more common causes of death, the number of deaths from each cause, and the approximate age at which they occur. At what age are deaths from heart disease most numerous? Tuberculosis?*

### Variations in Death-Rate:

The death-rate varies to some extent according to sex, age, climatic conditions, race, and occupation. The death-rate is much higher for infants and children under five than for children between the ages of five and ten. It is lowest in youth and early maturity, and gradually increases toward old age.

The death-rate is higher for men than for women, due perhaps to the more dangerous or more exposed occupations of the men. The death-rate is higher in tropical and semi-tropical countries than it is in the countries of the temperate zones. In the temperate zones it is higher in the winter than in the summer. The death-rate also varies according to race. For instance, in the United States in 1924, while the death-rate for the whole population was 11.8, for the negro population it was 17.6, and for the Indians 25.9. Certain occupations have a higher death-rate than others. Miners have a higher death-rate than professional men. In some countries, those who live in cities have a higher death-rate than those who live in the country, while in other nations the reverse is true. Perhaps you may be able to account for some of these variations. These facts tend to show the importance of vital statistics and the interesting problems they bring to the attention of the world.

### **Improvement in Health Conditions:**

The general improvement in health conditions in the United States is indicated in the report (revised edition, 1930) of the Joint Committee of the National Education Association (the national organization of American teachers and educators) and of American Medical Association (the national organization of American physicians). Over eighty of the

foremost authorities in the fields of medicine and education helped to compile this report. The report clearly indicates the nature of the improvement of health conditions in the United States. Among the statements made in the report are the following:

*Diphtheria:* The death-rate of diphtheria has been cut 95% since 1900. This is hailed as one of the most striking victories of medical progress during the past fifty years. The factors chiefly responsible are the discovery of diphtheria antitoxin and toxin-antitoxin, the former used to treat the disease and the latter to immunize children against the disease.

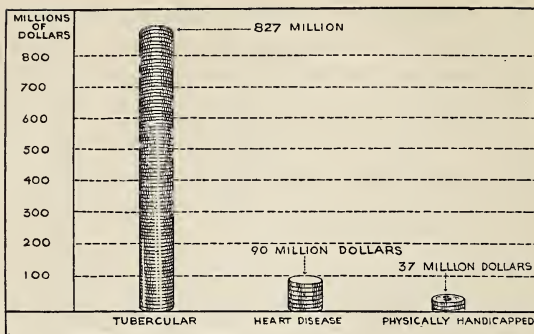
*Cost of Disease:* American tax-payers pay more than \$927,000,000 a year to care for sufferers from tuberculosis and heart disease and to assist those who are physically handicapped. Of this amount, \$800,000,000 goes to the tubercular, \$90,000,000 to cardiac victims, and \$37,000,000 to the physically handicapped.\* It is estimated that deaths from tuberculosis cost the people of the United States over \$1,500,000,000 a year. Therefore, despite the reduction of death and disease, the country still pays an appalling toll to sickness in money.

*Typhoid Fever:* The decrease in the death-rate for diphtheria is matched by that for typhoid and

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\*It is estimated that at the present time there are in the United States approximately 75,000 blind, 45,000 deaf and dumb, and well over 300,000 mental defectives.





### HEALTH ASSISTANCE

*This chart shows in terms of millions of dollars how much the American taxpayer spends each year for the care of those afflicted by the causes indicated above.*

paratyphoid. Since 1900 the filtration and chemical treatment of water, the pasteurization of milk, and the control of carriers have cut the death-rate for typhoid and paratyphoid from 34 persons per 100,000 to 4.9 per 100,000, in 1928.

This reduction was even more striking in military life where formerly typhoid took a very heavy toll. During the first two years of the Civil War, typhoid caused 1,961 deaths among every 100,000 soldiers, whereas during the first two years of the World War, only five soldiers out of every 100,000 died of this disease. This resulted in the saving of the lives of more than 31,000 soldiers.

*Other Diseases:* The report shows the almost



complete elimination of cholera, typhus, and yellow fever, all of which took thousands of lives in this country throughout the past century. This is attributed to the careful investigations and studies of the causes of disease and the application of proper preventive measures.

*Tuberculosis:* The death-rate from tuberculosis has decreased from 194 per 100,000 in 1900 to 79 per 100,000 in 1928. The causes of the decrease include improved living and economic conditions, particularly among the industrial population, educational campaigns by tuberculosis associations and health departments, and the increased facilities for early diagnosis and hospitalization and care of the sick. The decrease in tuberculosis mortality has been more marked at certain ages than at others. The least improvement seems to have occurred among young people, chiefly girls and women between the ages of 15 and 24.

*Increased Expectancy of Life:* Owing to the increased expectancy of life in this country due to the decrease in disease, the potential value of the newly born child's life has greatly increased, measured in terms of money. A boy baby born in 1924 was potentially worth \$1,780 more than such a child born in 1901. At that time, he would have been worth \$7,553 using his life expectancy and average earning capacity as a basis for calculation.

## PRACTICAL APPLICATIONS

## For Effective Study:

1. What is a patent medicine? A proprietary medicine?
2. Name some of the chief characteristics of modern medicine.
3. What is a "deficiency disease"?
4. What is meant by heliotherapy?
5. What are vitamins?
6. What are the endocrine glands?
7. What are vital statistics?  
How are they collected?  
What useful purpose do they serve?
8. Define (in your own words):
  - (a) birth-rate
  - (b) death-rate
  - (c) "crude" death-rate
  - (d) "corrected" death-rate
  - (e) "adjusted" death-rate
  - (f) "case" rates
  - (g) infant mortality rate
  - (h) life-expectancy

## For Discussion:

1. Compare the "modern" and the "medieval" points of view toward the use of drugs.
2. Upon what do patent medicines chiefly depend for their success?
3. In what respects are "self-diagnosis" and "self-medication" dangerous practices?
4. What should be our attitude toward new schools of healing?
5. What precautions should be observed in taking ultra-violet ray treatments?

6. What evidence can you give that there has been a general improvement in the health conditions of the United States during recent years?
7. To what causes may this improvement be attributed?

**For Health Habit Formation:**

1. List some suggested habits for good mental hygiene.
2. Make a list of any other desirable health habits suggested by reading this chapter. Where possible arrange them in natural groups.

## PART TWO

# SPECIAL TOPICS

### VIII. NUTRITION AND DIET

#### Introduction:

It should not be necessary to review *all* of those phases of nutrition concerning digestion and assimilation covered in the lower grades nor to study again the composition of foods. The newer knowledge of nutrition is important however. This chapter therefore deals principally with the various vitamins and certain other constituents of our food, knowledge of which is necessary for an intelligent regulation of one's diet.

The newer knowledge of nutrition is based largely upon the discoveries of modern science. Without them, man's selection of food would be on a basis but little higher than that of the animals—appetite and instinct, plus the result of general or individual experience.

#### Food Deficiencies:

We have already noted under the heading of Deficiency Diseases (Page 158) how bodily disturbances were caused by the absence of articles of food from the diet. A study of the oriental disease beriberi has shown after long and careful investigation that it was due to the removal of the hull or "silver-

skin" from raw rice. Some substance had been removed that was needed for life and growth. Had these people a broad choice of food for their diet, it is probable that the needful substance would have been acquired from some other food. But the disease generally occurred among people limited in their diet almost exclusively to rice. The hull of the rice was their only source of this vital substance. Scurvy, another deficiency disease, was found to have been caused by a lack of fresh fruits or fresh vegetables in the diet.

Instances such as these led scientists on a search for the nature of the missing substances that caused these food deficiency diseases. Experiments were made on the diet of animals and birds. It was soon discovered that something else was needed for life and health beside the ordinary classification of proteins, carbohydrates, fats and oils, and mineral salts. There was evidence of mysterious substances that evaded chemical analysis yet seemingly were present in food. Very little could be determined about them except the effects of their presence or absence in certain kinds of food. To this day we do not know what the composition of these vital and mysterious substances may be, but we do know that without them, impairment of health and growth results, even death itself. Because of their *vital* nature, these substances were called *vita-mines* (1912), later *vitamins* (vī'tă-mĭns).

## Vitamins:

Vitamins are substances of unknown composition normally found in most foods in very small quantities. Although their exact natures are unknown, scientific research has demonstrated that *something* is there. While we cannot describe them, we do know what happens when they are absent from food. In other words we know the function and the work, although the mysterious "worker" is itself unknown. By means of scientific experiments and investigations, it has been established that there are a number of different vitamins, each identified by its own distinct function. These functions are either associated with normal growth and development of some kind, or else are regarded as "protective" or "preventive" agents in the sense of preventing certain types of deficiency diseases. It is supposed that vitamins may function somewhat after the fashion of the hormones or "messengers" of the glands of internal secretion that are carried to the various parts of the body by the blood stream. (See pages 265-266.)

## "Fat Soluble A" and "Water Soluble B":

The first experiments seemed to indicate that there were only two of these mysterious substances, and from the little that could be determined about them one was called "fat-soluble" A and the other, "water-soluble" B. Later investigations indicated



that each of these was a group of vitamins. Consequently, instead of "fat-soluble" A, we now have vitamins A, D, and E, and instead of "water-soluble" B, we have vitamins B<sub>1</sub>, B<sub>2</sub>, and C. It is probable that as scientists improve their methods of analysis, new vitamins will be discovered and new information gained regarding the nature of those already classified.

A common method used in the study of vitamins today is experimentation with small animals like rats and mice. These animals are fed exclusively upon certain foods and their growth is carefully observed. They are found to thrive on a diet which contains vitamins. They fail to grow properly and are subject to certain diseases when put on a diet which is lacking in one or more of these important substances. It is to our advantage to keep ourselves informed of these discoveries and use this knowledge in planning the diet that is best suited to all our needs. We shall now discuss these vitamins in detail.

### VITAMIN D, "THE CALCIUM HELPER"

This is sometimes referred to as the "antirachitic" vitamin—the one that is especially concerned in the cure or treatment of rickets. Rickets is a disease, or rather a condition, often found in young children. It is marked by extreme softness or flexibility of the bones due to a deficiency of the

## THE WHITE RAT TEST



*Rats and other small animals lend themselves well to scientific experimentation. Much of what we know about vitamins was discovered in this manner. Above is indicated the results of a vitamin deficiency. The larger rat was given a diet with plenty of vitamins. The smaller rat did not grow properly because his diet was lacking in vitamin content.*

mineral calcium, or lime. Calcium is often referred to as "the bone builder." This deficiency of calcium may be due to faulty diet, a lack of leafy vegetables and milk, which are our chief sources of supply of calcium, or to a lack of sunlight. It has been found by scientists that even though sufficient calcium were present in the food supply, the conversion of this calcium into bone tissue would not take place without the effects of sunlight in some form.

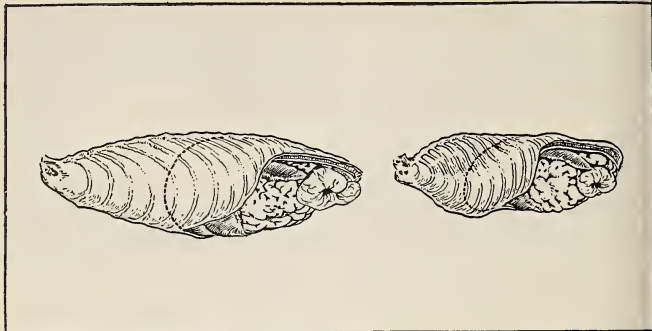
Children living in the smoky, cloudy, and foggy atmosphere of the great manufacturing cities of England had long been known to be sufferers from

rickets. Each particle of black soot in the air stopped some sunlight from reaching the inhabitants. As a result of this deficiency of sunlight, the children in such cities suffered from rickets to a marked degree.

Vitamin D may be supplied in two different ways. It may be taken into the body in the food that we eat or it may be produced within the body as a result of irradiation (exposure to sunlight or to the ultra-violet rays of the mercury quartz lamp).

Vitamin D is produced in the body in this manner: There is a substance called cholesterol which is present in animal fats and vegetable oils. In this substance cholesterol, there is another substance called ergosterol. When ergosterol is subjected to sunlight or to ultra-violet rays, it becomes "activated," and vitamin D is formed. In human beings, ergosterol is present in minute quantities (with cholesterol) in the fatty tissue of the skin. Sunlight or ultra-violet rays "activate" the ergosterol and vitamin D is produced. It is then absorbed by the blood stream and passes into the general circulation.

Since vitamin D is produced by the action of sunlight on ergosterol, which is found in animal fats and vegetable oils, it follows that vitamin D may be produced outside the body and then taken into the body as food or medicine. It has been



*Vitamin D is essential to proper bone growth and formation. On the left is the chest cavity of a normal rat. On the right is the chest cavity of a rat that had rickets. Similar effects are found in human beings who do not get sufficient Vitamin D during the period of bone growth and development.*

found that this beneficial result can be obtained from food subjected to sunshine or ultra-violet rays. In cod-liver oil we have an interesting example. The codfish eats a small green plant containing chlorophyll, a substance created by the action of the sun's rays on the plant. As a result, the liver of the cod is found to contain an oil which contains vitamin D. Irradiated ergosterol, containing vitamin D, has been placed on the market and a few drops taken with meals may be used to supply the requisite vitamin D. This is much preferred by children to cod-liver oil, although it should be

pointed out that there is an additional value in cod-liver oil as it contains other elements that are valuable to the body.

There are not many foods which contain vitamin D. The only sources which contain any great amounts are oils extracted from the liver and the body fats of certain fish. The amounts of vitamin D present in ordinary foods like milk and butter are very small, and vary in winter and summer. This variation is due, not to the diet of the cow, but to the amount of exposure to sunlight (irradiation) which the animal has had. It is present in minute quantities only, if at all, in green leaves and fresh fruits.

The great objection to oleomargarine, the substitute for butter, is that it is lacking in vitamin content. As a result of recent discoveries, an attempt is being made to supply this deficiency by introducing into the vegetable fats of the margarine some irradiated ergosterol containing vitamin D, thus making it equal to butter in this respect. At the same time, vitamin A extracted from animal livers can be added. This attempt, if worked out successfully, would make oleomargarine, which is an inexpensive substitute for butter, much less objectionable from a health point of view.

Scientific experimentation has also shown that by feeding cod-liver oil to the cow, the amounts of vitamin D and of vitamin A found in the milk fat



is greatly increased. This method of getting vitamin D (through butter and milk) would no doubt be welcomed by cheers from many youthful throats "Give the cod-liver oil to the cow!"

It is also probable that vitamin D is operative in raising the immunity-level of the body and in increasing our ability to resist disease. Such at least seems to be the result of abundant exposure to sunlight or the ultra-violet rays. How closely this increased immunity (especially to colds and respiratory diseases) may be related to vitamin D is not clearly understood. In the case of vitamin D produced within the body by exposure to sunlight or ultra-violet rays, the relationship seems quite close. In the case of vitamin D produced outside the body, and eaten in the form of food or medicine, it is possible that there is an increased immunity due to the increased nutritive powers of the body because of the presence of vitamin D in the system.

It should be remembered that it is vitamin D that is "the calcium helper," the substance without which calcium cannot be converted into hard bony tissue. Vitamin D, in connection with a proper supply of calcium in the diet, will prevent or cure rickets. This may be accomplished by the direct application of sunlight, or of the ultra-violet rays or by the taking of cod-liver oil or some equivalent such as irradiated ergosterol. Beneficial results



have been obtained also by irradiation of food, thus producing vitamin D in it before it is eaten.

For many years children in the British Isles have been subject to rickets and, consequently, the adults have had poor teeth and poor bone tissue. During the Boer War many volunteers were rejected for service because of poor teeth. It is a tradition that natives of the British Isles and of Ireland have poor teeth. It is now assumed that this was due to a lack of sunlight in childhood. The British Isles are subject to cloudy, foggy, and rainy weather which shuts off much of the natural supply of sunlight. This situation is worse in those places that have a great deal of smoke in the air in addition to cloudy or foggy atmospheric conditions. Many cities in America have a very definite smoke problem because of the presence of railroads or industrial establishments. It is probable that in many of these cities sufficient quantities of sunshine are able to penetrate the darkened atmosphere for only a few hours a day, and then only in the summer months. Miners who work underground away from the sunlight, and others who work at night and rest during the day, are often of a pale sickly color. They look weak and appear anemic beside the farmer who works in the sun. Children raised in great cities without the proper amount of sunlight often have a "washed out" appearance when compared to the sturdy, healthy-looking type who

are raised out of doors in a sunny country, Italy for example.

By artificial means or by natural means every one should be sure to receive sufficient vitamin D for the needs of the body. Nor is the calcium supply to be forgotten. Eat plenty of "green leaf" vegetables (lettuce, spinach, kale, etc.) and take at least one quart of whole milk daily. This includes all milk in whatever form as a drink, in a custard, ice cream, etc.

### **Border-Line Deficiency Is Dangerous:**

Rickets is a disease of the entire body, not merely the bones. Children are nervous and irritable, indifferent to things, and lacking in inclination to play when afflicted by it. They do not sleep well and the muscles are flabby and weak. The bones are seriously affected, and the skeleton as a consequence is frequently of poor formation. The teeth come late and decay early. Resistance to disease is lowered.

It should be borne in mind that not all cases of deficiency diseases have marked symptoms. Very often the deficiency exists under the surface, weakening the body structure and lowering resistance to disease. Cases of this type are a serious menace and must be avoided. One should be sure to eat well of a balanced diet to insure a sufficient supply of all factors and elements necessary to maintain normal health.

## VITAMIN A—ESSENTIAL TO HEALTH AND GROWTH

This vitamin will prevent or cure a very serious eye disease. In this disease the eye becomes swollen and ulcerated. In severe cases the infection may be so bad that even loss of sight may result. Such a condition has occurred in infants as a result of being limited to a diet of skimmed milk and cereal. It was found that animals deprived of the food in which this vitamin is found first stopped growing, then lost weight, and finally died. The eye condition generally developed before death. If, however, the vitamin was restored to the diet, the animal quickly recovered, normal growth was resumed, and the eye condition disappeared. A recent investigation indicated that vitamin A may also play an important part in the body as an anti-infective agent, particularly in preventing colds and other diseases of the respiratory tract.

Vitamin A is closely associated with vitamin D. They both belong to the "fat-soluble" group, both are necessary to normal growth, and they are frequently found together in the same type of food. Both have their origin or ultimate source in light.

Vitamin A is evidently created by the action of light upon green "leaves" or plants. This is the source from which animals, and even fish receive their vitamin A, either directly or indirectly. We



### LACK OF VITAMIN A

*This baby did not get sufficient Vitamin A because he was limited to a diet of skim milk and cereals. One eye is swollen shut; the other has an ulcer and the sight of it was lost.*

may receive vitamin A directly by eating a green leaf vegetable (or part of an above-the-ground vegetable), such as lettuce, spinach, or kale. Indirectly we may get vitamin A by drinking milk from the cow having originally eaten the green grass containing the vitamin. In the case of carnivorous (exclusively flesh-eating) animals, the supply of vitamin A is probably derived from eating the parts of herbivorous (plant-eating) animals which contain the vitamin, generally the viscera or internal organs. In this manner a lion or a tiger may obtain needed vitamins from a deer. It is not known that a lion requires vitamin A, but if he does (and it seems probable), that is how he

quires it. It is a well known fact that a wild animal first drinks the blood of its prey and then eats the viscera, leaving the meat to the end.

The richest sources of supply of vitamin A seem to be the liver fats of certain animals and fishes. In the liver oil (derived from the fat) of the salmon, the halibut, and the codfish, vitamin A is found along with vitamin D. It is also present in the body fat of certain animals and fishes. Eel oil is specially rich in vitamin A where it is again found with vitamin D. It is found in green leaf vegetables, and in milk and other dairy products.

The amount of vitamin A to be found in milk and other dairy products depends upon the diet of the cow and to some extent upon the season of the year, since the green leaf (grass) diet for the cow is not as abundant in winter as in summer. Vitamin A will be found chiefly in the cream. What relation does this have to the emphasis placed on the need for children and others to drink *whole* milk? What would be the consequence of drinking only skimmed milk? When the cream is made into butter, the most of the vitamin goes into the butter. What about the vitamin A content of buttermilk? When the fat is taken from the butter, however, the vitamin remains with the residue or what is left because vitamin A while it is a "fat-soluble," is not itself a fat.

Milk and other dairy products are not classed as



foods that have a rich supply of vitamin A, and it is therefore necessary for us to supplement them with a generous partaking of foods containing more plentiful contribution of vitamin A. Eggs, animal livers, and oils from fish livers are classed as excellent in this respect. *Whole* wheat and green vegetables, either fresh or cooked, may be classed next as "good." It is interesting to note in this connection that the outer green leaves of lettuce contain more vitamin A than the inner, paler leaves (or the heart) of the lettuce. Besides the so-called green leaf vegetables—lettuce, spinach, kale, cabbage—the edible portions of any of the tops or above-ground parts of vegetables may be used. In addition to the quart of whole milk recommended for each day because it contains all vitamins and the valuable calcium, there should be at least one other food each day containing vitamin A. Asparagus, fresh string beans, fresh or canned peas, and tomatoes either canned or raw are also valuable for their vitamin A content. There is some vitamin A also in potatoes, but the supply there is not so plentiful as in the sources above mentioned. The amount of vitamin A in other foods may be ascertained by consulting the lists on pages 209 and 224.

### **Sugar Contains no Vitamin A:**

It is interesting to note that sugar foods, such



s honey, molasses, or granulated sugar, do not contain any vitamin A. The displacement of a normal supply of foods containing vitamin A, by the consumption of an abnormal supply of candies and sweets is, therefore, a serious threat to normal growth. This is a matter which should be given careful attention by every growing boy and girl. The candy habit is one that crops out during the adolescent years and in some becomes quite abnormal. The sweet foods, sugars, are not actually needed for the chemistry of the body since the starchy foods are dissolved into sugars and supply enough for those needs. It has been shown that animals whose normal diet sufficient for growth is reduced to half and the missing half is replaced by sugars, will have their growth and development seriously disturbed. It is to your interest therefore to see that sugar foods do not occupy too great a place in your daily diet.

It is vitamin A that enables animals and human beings to grow and develop properly. Certain animals fed on milk and whole wheat will grow at a normal rate. If they are deprived of this vitamin, they lose weight and become ill. It is therefore wise for all of us, particularly those who have not yet attained their full growth and development to be sure to eat a normal amount of the foods containing at least a fair supply of vitamin A, such as eggs, liver, milk, and the green leaf vegetables.

**VITAMIN E—THE ANTI-STERILITY VITAMIN**

This is the last of the "fat-soluble" vitamins known to us at the present time. By experiments on rats it has been found that an absence of this vitamin leads to sterility (inability to reproduce offspring) in both male and female. It is assumed that it may similarly affect human beings. Its greatest source of supply seems to be the green vegetables either fresh or cooked, whole wheat, and eggs. It is also found in lean meat, milk, butter, vegetable margarine, and legumes (peas and beans).

**VITAMIN C—THE ANTI-SCORBUTIC VITAMIN**

This is the first of the "water-soluble" vitamins. It is the vitamin that protects us against scurvy. It is also regarded as an agent protective of the general health, and in particular, of the teeth and the gums. The chief source of this vitamin is fresh food—fresh vegetables and fresh fruit—particularly the juices of fresh oranges, lemons, and limes.

Scurvy is a disease that develops from an insufficient quantity of fresh food. It is a disease that develops gradually; therefore it would take some time on a continuously deficient diet for marked symptoms to develop. Victims of scurvy lose weight, appear undernourished (anemic), pale, weak, and are short of breath. The gums become swollen and ulcerated and bleed easily. Teeth drop out. Blood

vessels rupture, and in the later stages of the disease, there follow headaches, convulsions, delirium, and death. .

Scurvy has probably existed from early times, wherever fresh food could not be obtained for any great length of time. Such conditions have arisen in prisons, in large armies, on exploring expeditions, and on long sea voyages. The disease is known to have been present in the armies of the Crusaders during the sieges of Cairo and Damietta in the thirteenth century.

The discovery of America led to an era of exploration and long sea voyages during which sailors were frequently subjected to scurvy without realizing the cause, although it was often suspected that food had something to do with the affliction. We have the record of scurvy among the sailors of Vasco da Gama. Once they received a gift from an African chief—"the finest oranges and lemons they had ever seen." These they consumed. The scurvy "mysteriously" disappeared!

The French explorer, Cartier, in 1536 on his voyage to the new world lost twenty-six sailors from scurvy. The others were saved by boiling a beverage from pine needles. After a number of experiences of this sort, it was gradually realized that somehow fresh fruits and vegetables were effective both in preventing and in curing scurvy. About 1800 the British navy prescribed a sys-

tematic administration of lime juice to all sailors, because it had been found to be particularly valuable in the prevention and cure of scurvy. The lime juice kept its properties well, and it was easy to carry and to keep aboard ship. This measure practically eliminated scurvy from the British navy. Later (1865) the British Board of Trade made a similar requirement of all ships flying the British flag. This was accompanied by similar good results. Since the introduction of steam for ocean going vessels, the danger of scurvy as a disease of sailors has largely disappeared. It is still possible, of course, when sailing vessels are used for long voyages.

Count Felix von Luckner, the famous German raider during the World War, lost his ship on a reef in the Pacific. He and five companions set out in a lifeboat only 18 feet long and in it sailed 2,300 miles. During this long journey, fresh food was lacking and they were attacked by scurvy. Here is the account in the words of Count Luckner:

And then came the sailor's worst enemy, scurvy. Our diet of hardtack, lack of exercise, and general hardships brought it on. Our knees swelled up so badly that we had to cut our trousers. The rocking of the boat knocked them together or against the wooden sides, and then the pain was almost unendurable. Our lips were black and broken. Our tongues were swollen and hard. It was as if you had a stone in your mouth. Our gums became snow white and seemed to recede. Our teeth felt as though they were sticking far out of our jaws. They hurt constantly and were

loose and felt as if they were going to drop out. With these shaking teeth we ate our hardtack. I never before knew how hard hardtack was. We had unending headaches, and it seemed as if something were pressing our eyes right out of their sockets. We got water in our legs, and could hardly stand any more. We had to slide around the seats to do what had to be done in navigating the boat.

You have read in many a sea story about the delight, the almost insane ecstasy, of castaway men adrift in open boats who were dying of hunger, thirst, and disease, when at last, a rescuing ship approaches or they see land. No matter how the writers describe it, even the greatest of writers, they can tell you only a tiny bit, only a grain of sand. So I won't try to say how we felt when we saw a speck on the horizon and the speck grew bigger and turned into the familiar green of a tropical island. We had been so much like dead men, who had thought that nothing could even make us glad again. By Joe, that sight gladdened our hearts, though. We grew even weaker, but it was the weakness of happiness. As we drew near, we thought of nothing but land, fresh water, and soft food, a soft banana, for our loose, shaky teeth. Never mind ships or capturing ships. Never mind being taken prisoners. We headed straight toward a crude pier that stuck out into the water.

A crowd of a hundred natives, perhaps less, were gathered at the landing place watching our approach. They were ferocious-looking black warriors. We had now passed from the region of the brown, indolent Polynesians to those of the black, warlike Melanesians.

They said there were no white men on the island, and we longed to go ashore. With our scurvy-swollen legs we could hardly stand, however. It wouldn't do to be hauled ashore as cripples. It would not increase these warriors'



respect for Germans as fighting men: Cripples do not fare well among savage peoples, and we thought it best not to reveal our impotence. So we refused the natives' invitations to partake of their hospitality, told them we must hurry on to fight the British, and asked for fresh water and bananas. They brought great gourds full of water and bunches of bananas. We drew up to the dock and they handed these precious supplies down for us.

We had our fill of bananas and water, and, with shouts resounding from the shore, set sail again. This lucky spot was Niué, an outlying isle of the Fiji group. The sun blazed down upon us, but a fair wind carried us along briskly. The first day after leaving Niué, we felt better. The second day we were on the road to high good health. It is amazing the curative effect of fresh fruit, especially bananas, when you are suffering from scurvy. They seem to put new life and blood into you and draw the sickness right out of the body as though some huge and marvelous poultice had been applied.\*

Lime juice as a preventive of scurvy was used by a number of exploring expeditions both in the Arctic and in the Antarctic regions. In several instances scurvy appeared in spite of the lime juice, but this was due possibly to an inferior quality of lime juice, or to its adulteration with water. It is interesting to note that there is a great difference in the quality of limes. The juice of the lime that comes from the region of the Mediterranean Sea has four times the protective value of the juice of the lime that comes from the region of the West Indies. It is also possible that the lime juice that failed to

\* (From *Count Luckner, The Sea Devil* by Lowell Thomas, copyright 1927 by Doubleday, Doran and Company, Inc.)



# VITAMINS IN FOODS

	"A"	"B"	"C"	"D"		"A"	"B"	"C"	"D"
BREAD, (WATER) .....	?	+	-	-	WALNUTS .....	+	++	*	
" , (MILK) .....	+	+	-	+	TOMATO (RAW OR CANNED) .....	++	++	+++	
" , WHOLE WHEAT (WATER) .....	+	++	?	-	BEANS, KIDNEY .....	+	+++	*	
" , " " (MILK) .....	++	++	?	+	" NAVY .....	+	+++	*	
BARLEY (WHOLE) .....	+	++	-		" STRING .....	++	++	++	
CORN, YELLOW .....	++	++	-		BEETS (ROOTS) .....	+	+	+	
OATS .....	+	++	-	-	BEETS (GREENS) .....	++	++	*	
RYE, CRACKED .....	+	++	?		CABBAGE, RAW .....	++	++	+++	
WHEAT, WHOLE .....	+	++	-	?	" , CANNED .....	+	++	++	
" , BRAN .....	+	++	-		" , COOKED BRIEFLY .....	+	++	+	
LIVER .....	++	++	+	+	CARROT .....	+++	++	++	
KIDNEY .....	++	++	+	+	CAULIFLOWER .....	+	++	+	
BRAINS .....	+	++	?	+	DANDELION GREENS .....	++	++	+	+
HEART .....	+	++	+	+	WATERCRESS .....	+++	*	+++	+V
FISH, FAT .....	+	+	?	-	LETTUCE (GARDEN) .....	++	++	+++	+
" , ROE .....	++	++	?	+	ONIONS .....	+	+	++	
COD-LIVER OIL .....	+++	-	-	++	PARSNIP .....	+	++	?	
MILK, FRESH, (UNPASTEURIZED) .....	+++	++	+V	++V	PEAS, FRESH .....	++	++	+++	+
" , CONDENSED .....	+++	++	+V	+V	POTATO (BOILED) .....	+	++	++	
" , EVAPORATED .....	+++	++	?		SWEET POTATO .....	++	++	++	
" , DRIED, (WHOLE) .....	+++	++	+V		SPINACH (COOKED) .....	+++	+++	+	
" , SKIMMED .....	+	++	+V		SQUASH .....	++	*	*	
BUTTERMILK .....	+	++	+V		TURNIPS .....	-	++	++	
CREAM .....	+++	++	+V		APPLES .....	+	++	++	
BUTTER .....	+++	-	-	+V	BANANAS .....	+	+	++	
CHEESE (WHOLE MILK) .....	++	?	*		GRAPES .....	+	++	+	
EGGS .....	+++	+	-	+	GRAPEFRUIT .....	+	++	+++	
ALMONDS .....	+	++	*		LEMON JUICE .....	+	++	+++	
COCONUT .....	+	++	*	+	ORANGE JUICE .....	+	++	+++	
HICKORY NUTS .....	*	++	*		PINEAPPLE (RAW OR CANNED) .....	++	++	++	
PEANUTS .....	+	++	*		RASPBERRIES (RAW OR CANNED) .....	*	*	++	
					PEACHES (RAW OR CANNED) .....	+	++	++	

+ contains the Vitamin

++ good source of the Vitamin

+++ excellent source of the Vitamin

- no appreciable amount of the Vitamin

? doubt as to presence or relative amount

\* evidence lacking or insufficient

V variable

protect from scurvy may have been previously heated in order to preserve it. It has since been discovered that much vitamin C is lost when food is cooked or heated. It is the vitamin that is particularly susceptible to heat or even drying. Dried fruits and vegetables lose most of their vitamin C in cooking.

The prevention of scurvy in large armies has always been a problem. Fresh fruits and vegetables, because of their perishable nature, are not easy to distribute in an army. Quick distribution of food supplies in an army of hundreds of thousands of men is difficult. The problem became doubly difficult if the army stayed for some time in the same locality thus using up all of the available supplies of fruits and vegetables. Such conditions occurred in the old days particularly during the sieges of cities, which frequently lasted for months. The commissary (quartermaster's) departments of modern armies by the application of scientific methods and a high degree of efficiency in organization, have been able to eliminate scurvy.

Prisoners until comparatively recent times were notoriously ill fed as well as ill kept. Consequently scurvy was an added penalty that was frequently incurred by these unfortunates. Modern humanitarian methods applied to prison life have resulted in an improvement of diet and the elimination of scurvy wherever these methods have been used.

It is interesting to look back over history and to note how scurvy appeared as a result of changing human conditions. It first appeared among soldiers or prisoners in the ancient and medieval times, since they were the ones who were frequently forced to go for a long time on a simple diet of dried, cooked, or stale food of the type that did not contain much vitamin C, such as the grains and peas and beans. This was largely because these foods were easy to transport, easy to keep, and easy to distribute. They also have a high nourishing value, aside from their lack of vitamin C. Modern methods have remedied this.

When sailors began to take long sea voyages, away from land for months, they began to be subject to scurvy. This finally was corrected and now steam and oil power ships have eliminated much of the danger.

At the present time the menace *is largely confined to infants*. Of recent years proof of scurvy among the infants of various nations has been very definite. There is no evidence of this in earlier times. Why? Mainly because the modern infant is for so many reasons subject to artificial feeding. Furthermore, the limited amount of vitamin C contained in raw milk is reduced by the heating process necessary to Pasteurize it, now a requirement in large cities. To safeguard infants from scurvy, they should be given liberal quantities of

raw milk if possible. In this respect "certified milk" is better than "Pasteurized" milk although it is more expensive. Because of the difficulty of getting a sufficient supply of vitamin C from milk, and since certified milk is too expensive for many people, doctors generally prescribe a regular feeding of either orange or tomato juice to all babies. This should be a part of the daily program for every child as vitamin C is essential to normal health and growth.

Although it became generally accepted that fresh fruits and vegetables were necessary for the prevention or cure of scurvy, little was known about the exact origin of the disease itself. In 1895 an American, Dr. Theobald Smith of the Rockefeller Institute for Medical Research, observed that a limitation of the diet of guinea pigs to oats and bran led to a condition similar to scurvy in human beings. However, no one attempted to follow up this lead for some time.

In 1912 two Norwegian scientists, Holst and Frölich of the University of Christiania, discovered that a scurvy-like disease was produced in guinea pigs by restricting them to a diet of cereals or of bread. This was similar to Dr. Smith's discovery. The Norwegians, however, continued their investigations beyond. They found that if the guinea pigs were limited to a diet of carrots, turnips, or dandelions they did not develop the disease, but did

lose weight. They further found that feeding the animals small quantities of fresh cabbage, carrots, or other fresh vegetables cured the guinea pigs of their symptoms of scurvy. This led them to believe that the disease scurvy was caused by the absence of some unknown chemical substance from the diets. They showed that this unknown substance seemed to disappear from fresh fruits and vegetables when they were cooked, dried, or kept for a long time. Later investigations by other scientists have confirmed these findings, and the unknown element has been designated as vitamin C. Its chief characteristics are: (1) it protects us against scurvy, maintaining thereby our general health and in particular the health of the teeth and the gums; (2) it is found mainly in fresh fruits and vegetables; and (3) it tends to diminish or disappear when food is heated, dried, or permitted to age.

### Sources of Vitamin C:

The richest sources of supply of vitamin C are found in the green leaves of cabbage, lettuce, and spinach in their raw, uncooked state. Cooking reduces the vitamin C to a very low content. The juices of the citrus fruits, oranges, lemons, limes, and grapefruit are also in the highest class in this respect, as also are strawberries. Tomatoes are high in vitamin C and because of the short time



they are exposed to the air while being heated (in the canning process), there is but small loss of vitamin C in the process. Canned tomatoes are therefore, unique in this respect; they contain almost as much vitamin C as the fresh tomato itself. In the winter time when fresh tomatoes are not available, canned tomatoes may be used to equal advantage provided they have been but recently opened and have not been cooked since opening. Physicians have of late been recommending tomato juice equally with orange juice as an important vitamin source for infants and children. In some cases there are important reasons which prevent the giving of orange juice to a child, and in such cases it is fortunate that so valuable an alternative as tomato juice is available. It should be emphasized also that where orange juice or tomato juice has been prescribed by the physician as a part of the young child's daily program, it should be given regularly and without fail. The importance of vitamin C in the diet is easily recognized when one considers the symptoms of scurvy. Remember that relatively little vitamin C is found in milk, the great bulk of a child's food, nor is much of it to be found in cereals, and very little in any cooked vegetables. It is not hard to understand how a young child might very easily be deprived of a sufficient supply of this important vitamin.

Other foods which contain an important amount



of vitamin C are: raw fresh apples, raw fresh bananas, raw fresh peaches, pineapples (fresh or canned), fresh string beans, raw fresh onions, fresh peas (home cooked and canned), white potatoes (boiled 15 minutes), and spinach (home cooked). Next in their content of vitamin C, but still containing a fair amount are: Beets (roots), cabbage (cooked), cauliflower, onions (cooked), white potatoes (boiled one hour), oysters, liver, whole fresh cow's milk, and condensed milk. Some foods contain very small amounts if any of vitamin C. They are: lean beef, evaporated milk, fresh skim milk, buttermilk, white bread (milk), and cream.

### VITAMINS B<sub>1</sub> AND B<sub>2</sub>

Vitamins B<sub>1</sub> and B<sub>2</sub> were originally thought to be only one vitamin known as vitamin B. It was believed that the same vitamin caused the two deficiency diseases, beri-beri and pellagra. Later investigations, however, have shown that two separate vitamins were involved. Occasionally one may see or hear "vitamin B" referred to. This means that the writer or the speaker has in mind the classification used before the two vitamins were separated. The two vitamins are so similar that many charts and books dealing with experiments and investigations of the presence of these vitamins in foods, still find it convenient to refer to them as

vitamin B. Such charts and summaries will no doubt continue to be used until the two vitamins have been separated more thoroughly.

### VITAMIN B<sub>1</sub>—THE BERI-BERI PREVENTIVE

This vitamin is sometimes known as vitamin F. It is an important factor in the maintenance of growth and well-being. It is found in large amount in the tiny germ which is attached to the kernels of grains or seeds, of which rice, wheat, and rye are the most notable examples. The milling or removal of the outer coverings from the kernel generally removes the tiny "germ" in the process. Rice thus milled is known as polished rice. Flour made from wheat so milled is the ordinary white flour used in white bread, in contrast to the brown color of whole wheat bread which has been made from the entire grain. This latter contains the germ so rich in vitamin B<sub>1</sub>. Vitamin B<sub>1</sub> (F) is also found in a long list of foods, the best supplies coming from egg yolk, fish roe, peas and beans, yeast, liver, green vegetables, and turnips. It is present in lean meat, milk, and potatoes and to a very small degree in fresh fruit and white bread.

Polished rice has been for ages the main bulk of the food of vast multitudes of people in the Far East—Japan, the Dutch East Indies, Malay Peninsula, Philippine Islands, India, and southern China.

Whenever by force of circumstances the diet of these people became almost if not entirely restricted to polished rice, attacks of the disease known as beri-beri occurred. But while it is an oriental disease, it has occurred also in other parts of the world whenever the diet becomes too restricted, and the supply of vitamin B has been shut off or very much reduced. Norwegian sailors were afflicted by it in 1894. The disease was caused by the substitution of white bread for rye bread made from flour which included the germ. One captain kept some rye bread for his own use. He was not subjected to the disease.

The most prominent outward symptom of beri-beri is the loss of ability to coördinate muscular action. This is due to the breaking down of the tissue in the nerves which control the muscular action. Further investigations have indicated that practically the whole body is affected in one way or another. The brain, the thymus, thyroid, sex, and adrenal glands, the spleen, pancreas, heart, liver, kidneys, stomach, and the intestines are affected. With this occur disturbances of the digestive and assimilative processes, and the lowering of the body resistance against disease.

### **Border-Line Deficiency:**

Beri-beri is a disease little likely to affect the average person in this country, but it has been

pointed out that there are probably many people suffering from a vitamin deficiency who do not have the marked symptoms of any one disease. In other words they may not be getting quite enough of a particular vitamin. They do not have any marked symptoms but their general health is being undermined in a way that will perhaps mean illness in the future.

### VITAMIN B<sub>2</sub>—THE “PELLAGRA- PREVENTING” VITAMIN

Originally this vitamin was thought to be identical with vitamin B<sub>1</sub>—the beri-beri preventive and both were known as vitamin B. Occasionally they are known respectively as F and G. The letter G was applied to vitamin B<sub>2</sub> as a mark of esteem for the service of Dr. Goldberger of the United States Public Health Service in connection with his studies of this particular vitamin. It is also sometimes known as vitamin “P-P”—“pellagra preventing.” It is probable however that the greatest acceptance will be given to the designation B<sub>1</sub> and B<sub>2</sub> because of their close similarity to the original vitamin B, so-called, which they together now supplant.

Pellagra is a food deficiency disease that for centuries has been an affliction of the poorest peasants of France and Italy, and which since 1900 has been all too common among the poorer people in



**DR. JOSEPH GOLDBERGER**

*As an official of the United States Public Health Service, he discovered the "pellagra preventing" vitamin ( $B_2$ )*

the southern part of the United States. The latter, because of economic conditions, are forced to exist largely on corn meal, hominy, pork, and cane syrup, especially during the winter months. The disease pellagra can be prevented by a diet which includes milk, eggs, and a variety of fresh meats. These foods contain vitamin  $B_2$  but they are too expensive for the people who need them most. Dr. Goldberger found that a plentiful supply of this vitamin might be obtained in yeast. Yeast is cheap and there is great hope for the elimination of pellagra as the knowledge of its prevention and cure spreads among those who are most liable to its attacks. It is interesting to note that Dr. Goldberger and his associates in his experiments attempted deliberately to infect themselves with pellagra by trying to



“catch it” from men who were sick with the disease. All of the common methods of transmitting a contagious disease were tried and yet pellagra was not passed from a sick person to a well person. On the other hand, the cases of pellagra in many institutions and orphan asylums were cured completely by adding milk, eggs, and meat to the diet. When this diet was applied, it was usual for every case of pellagra to disappear and not return. There were 105 sufferers from pellagra in one institution. All were cured and in no case was there a re-attack. This indicates clearly that pellagra is not a contagious germ disease, but essentially a food deficiency disease that develops from a faulty diet.

Pellagra manifests itself in a variety of ways. Skin eruptions appear in various parts of the body and there are disturbances in the functions of the nervous system and the digestive system. Severe attacks often result in death. Reference is again made at this point to the warning given about borderline cases of malnutrition or of food deficiency. If your diet is faulty, you may not develop pellagra but you may, under the surface, weaken your organs and your bodily condition. The remedy lies in a balanced and varied diet.

### SUMMARY—VITAMINS

It will have been noted under each of the various vitamins that considerable stress has been laid





*This shows the skin eruptions that result from a lack of Vitamin B<sub>2</sub> which causes pellagra. Such a condition is caused by a diet consisting of white flour, degerminated cornmeal, rice, starch, sugar, pork fat, sweet potato, molasses, and cabbage, and lacking in milk, eggs, and fresh meat.*

upon the necessity of a varied and balanced diet. Emphasis is placed upon the value of fresh vegetables, particularly the green leafy vegetables. People who live mainly on a diet composed of milled cereal or grain products, sugar, syrup, potatoes, and meat are in serious danger of vitamin deficiency. Yet meals composed of the above elements were most common not many years ago, before the value of fresh green vegetables had become fairly well known. Even today there are no doubt many families and homes in which this type of meal is the prevailing one. The change in "style" of diet has been a very beneficial one for the American public, as is indicated in the edi-

torial printed on page 236. Be sure that your own meals are modern—that they include some fresh fruits, fresh vegetables, or green leafy vegetables.

Another important point upon which the general public needs education is that a diet which is lacking in protective foods, or vitamins, leads to poor physical development and low standards of health. These manifest themselves in poor teeth, poor digestion, nervous instability, and other disorders. It should be emphasized that vitamins are of importance to adults as well as to children. It is possible that the alarming increase of malnutrition and dental decay among children may be symptoms of a deficient diet. It is possible that we as a nation eat too much white flour food, degerminated corn meal, cereals, potatoes, and meat and too little of the protective foods, such as milk and the green leafy vegetables. It may be that many of us are victims of borderline deficiency, or borderline malnutrition.

Experiments have been made to see if harmful effects can result from taking too much vitamin, or if one vitamin taken out of proportion to other vitamins can be harmful. While there is little evidence of a positive nature, it is probable that there is no danger from this source, provided the vitamins are derived from an ordinary diet. The purpose in emphasizing the nature and importance of the various vitamins is not to create an attitude of

being a crank, or fanatic, on vitamins, but merely to show the need for variety and balance in diet. Probably a surprising number of people limit their diet to too narrow a range. An instance of this is the case of a young man who would eat nothing but meat, potatoes, and gravy at mealtime because he did not care for any other kind of food. Children in many places are being raised on diets too limited in variety, either because of force of circumstances or lack of knowledge, such as the case of the baby (p. 200) that was limited to skim milk and cereal.

The great advances in the use of refrigerator cars and cold storage for fruits and vegetables have made it possible to bring the products of the bright, warm sunshine of California and Florida to the cold, icebound northern cities in the winter season. Fresh, green vegetables and fresh fruits are now obtainable at all seasons of the year in almost every part of the country. Be sure to eat your share.

Cooking does not seem to have the same effect upon all of the vitamins. Vitamin A is not greatly affected by heat. Vitamin B<sub>1</sub> and B<sub>2</sub> can withstand the ordinary cooking temperatures unless an alkali like soda is used in the water. The addition of soda to "soften" cooking water is destructive to these vitamins. Vitamin C is destroyed more easily by cooking than the others. Cooked cabbage, for

## AN INDEX TO VITAMINS

	A	D	E	B <sub>1</sub>	B <sub>2</sub>	C
Bread, white.....	x	x	x	IV	x	x
†Wheat germ.....	II	x	I	I	III	x
Butter.....	III	III	III	x	x	x
Margarine, vegetable.....	x	x	III	x	x	x
Cheese.....	III	III	x	x	x	x
Eggs.....	I	x	I	I	III	x
Fish.....	x	x	x	x	x	x
Fruit, fresh.....	II	x	x	IV	IV	I to * IV
Legumes (peas, beans, etc.).....	x	x	III	I	III	x
Liver, mammal.....	I	x	x	II	x	x
Meat, lean.....	x	x	III	III	II	IV
Milk.....	III	III	III	III	III	III
Oils, fish liver.....	I	I	x	x	x	x
Potatoes.....	IV	x	x	III	x	III
Turnips.....	x	x	x	II	x	I
Vegetables, fresh green.....	II	x	I	II	IV	I
“ cooked “ .....	II	x	I	II	IV	III
Yeast.....	x	?	x	I	I	x

## KEY TO CHART

I—abundant supply.

?—doubtful.

II—good supply.

x—no evidence of presence.

III—fair supply.

\*—varies according to kind.

IV—poor supply.

†—found in whole wheat bread  
and whole wheat cereals.

example, has been found to have had almost ninety per cent of its vitamin C content destroyed. The drying of fruits and vegetables is destructive to this vitamin. Fresh vegetables contain a large amount of vitamin C. These facts all point to the necessity of making as much use as possible of fresh vegetables and fruits to make up for possible deficiencies of vitamins in our diet.

The following article is used with permission of the American Public Health Association and may contain some points that will enable you to keep these elusive vitamins more distinctly in your mind:

## VITAMINS MADE EASY



"The whole subject of vitamins may be condensed to five words, or, if that is too many, to three. If three words put too much of a strain upon the memory, one—beginning with *V* just like the word *vitamin* itself—can cover the whole story.

"There are four vitamins very important for proper nutrition—A, B, C, and D they are called.

"*Vitamin A* is found in things that are naturally colored, particularly green or yellow such as cream, butter, eggs, carrots, squash, sweet potatoes and all



manner of green vegetables. *Colored* is the word to remember. Get lots of color on the table; it's fashionable anyway.

"*Vitamin B* has two important sources. In the animal kingdom it is usually found abundantly in the *vital* organs and the products of these organs such as liver, sweetbreads, kidney, blood, milk, and eggs. *Vital* is the word. In the vegetable kingdom it is found in the *coverings* of foods. To get it, eat bran and the leaves and stems of plants. Whole wheat, potatoes with their jackets on, unpeeled fruits, and leafy vegetables supply it abundantly. *Coverings* is the word.

"*Vitamin C* is found in *fresh* things. Fresh fruits, fresh vegetables, fresh milk. It is particularly plentiful in the juice of oranges and tomatoes, and in many other things as well. Cooking and the lapses of time usually destroy it, though it is still present in canned tomatoes. *Fresh* is the word.

"*Vitamin D* is found in *sunlight*, in light similar to sunlight, and in foods recently having been in the sunlight. Give the children plenty of sun—of ultra-violet light, if the doctor advises it. Feed them on fruits and vegetables which have grown in the sunlight. Cod-liver oil is also rich in vitamin D and helps to build strong, straight, and sturdy bodies. *Sunlight* is the word to remember.

"If then you use food suggested by the word *colored, vital, coverings, fresh, sunlight* you may be



sure that vitamins in abundance have been supplied. The three words covering the same subject are: *milk, fruits, vegetables*. Or, if a single word is desired, it is *variety* beginning with *V* just like *vitamins*. Those who eat a variety of foods need have little fear concerning vitamins or any other of the many food requirements."

(Reproduced by permission of American Public Health Association.)

COLORED VITAL COVERINGS  
 (A) (B) (B)  
 FRESH SUNSHINE  
 (C) (D)  
 (OR) VARIETY = VITAMINS  
 (IN FOODS) (A) (B) (C) (D)

### VITAMINS

*Learn these nonsense syllables. They will aid you in remembering which foods are valuable for their vitamin content.*

### CEREALS

#### Importance of Cereals:

By cereals we mean the common "seed" foods, such as barley, wheat, oats, maize (corn), rye, and rice. They take their name from the Cerealia,

the ceremonies by which the Romans celebrate the festival of Ceres, the goddess of the food plants particularly the grains. Rice is by far the least nutritious of all the cereals, yet it forms the bulk of the food of the millions of people in the crowded populations of India and eastern Asia.

The cereals form the backbone of the food supply of nearly all nations. They are inexpensive forms of supplying heat and energy. Much is turned into flour, thence into bread commonly accepted as "the staff of life." Great quantities are used as breakfast foods and some as desserts. Corn starch and rice are used as bases for puddings. In this connection it should be remembered that tapioca is not one of the cereals since it comes from the root of the sago plant, although it has a strong resemblance to some of the cereals in its composition and its uses.

### Value of the Whole Grains:

The value of the whole grains, which was emphasized in discussing the vitamins, is repeated at this point. The most of the mineral and vitamin content of the cereals is to be found in the outer coat. When the grain is hulled or refined, these valuable contributions to one's diet are lost. One should try to make up the loss in some other way as by the eating of bran. When there is a balanced and varied diet composed of plenty of milk and

eggs, fruits and vegetables, the loss of vitamin and mineral caused by eating the refined forms of cereals would probably not be felt. The loss would be made up or supplied by the other foods. But where the diet is almost exclusively confined to cereals and is lacking in milk, eggs, fruits, and fresh vegetables, the eating of the refined forms of cereals might be seriously detrimental to health. There would be no assurance that the needed vitamin and mineral content could be made up from any other available food. Therefore, where the diet is limited, the whole grain form of cereals should be used.

### Corn:

Maize or Indian corn is generally agreed to be a native plant of America. The Indians were cultivating it at the time of the discovery of America, and it spread from this continent to other parts of the world. The early colonists found it a valuable aid in sustaining life in their hard struggle for existence. It could be planted and gathered easily in the rough clearings, and the climate of the eastern coast of the United States was favorable for its production since it was fairly warm and moisture was abundant. Today the great corn raising region of the United States is in the states that lie in the fertile plain of the Mississippi Valley. It is frequently referred to as the Corn Belt. The

annual crop of maize or Indian corn in the United States is well over two billion bushels, representing about seventy per cent of the world's supply. The corn crop of the United States exceeds that of all the other cereals combined.

The oil contained in corn is valuable for fattening purposes, consequently over fifty-five per cent of the entire corn crop of the United States is used for fodder in the raising of cattle. Besides its use as a fresh vegetable, corn is converted into flour or meal and is used in various forms—johnny cakes, corn pone, hominy, corn starch, corn syrup, and breakfast foods.

### **Wheat:**

The United States is the greatest wheat producing country in the world. So much is produced that in recent years there has been a grave problem of overproduction. In other words, more wheat has been raised than the farmers can profitably market. This means that the price is kept low. In view of the abundance of cheap wheat, the enormous crop production, the use of labor-saving machinery, and the relative prosperity of our people compared to the people of other countries, the inhabitants of the United States have become the greatest wheat *consuming* people in the world. It is interesting to note that in eastern Asia wheat is even beginning to replace rice as the staple of native diet.

Despite the tremendous wheat consumption in the United States, there has been of recent years some decrease in per capita consumption. This is due to several factors in our national situation. Greater prosperity has enabled our people to diversify their diet by broadening their choice of foods. People are eating less of wheat and other grain products because they can afford other things that constitute a pleasing variety. They are aided in this by improved facilities for transporting and distributing other foods—fresh meats, fresh vegetables, and fresh fruits. In addition, the educational campaign in favor of the whole grains has reacted somewhat against the demand for white bread, which in previous years was used almost exclusively.

### **Place of Cereals in Our Diet:**

The cereals are carbohydrates although they do contain minor quantities of protein, fats, and mineral matter. They supply heat and energy through their conversion into starches and then into sugars. To eat too much cereal is in effect like eating too much sugar. The excess calories are stored up as fatty tissue. Because of the great abundance of wheat and corn in the United States, there is danger of the carbohydrates taking too great a place in our diet. The change toward a variety in diet, particularly the substitution of fresh fruits and vege-

tables and of whole grain for refined cereal, should be a beneficial one.

The value of a warm breakfast cereal over cold one, particularly in the wintertime, must not be forgotten. Much of the value of a breakfast cereal comes from the use of milk or cream which accompanies it. Whole grained cereals, used either as breakfast food or bread, are often preferred to refined cereals because they provide bulk and because they contain valuable vitamin and mineral content that is missing from the refined product.

## SUGAR

### Kinds of Sugar:

There are over one hundred substances that have distinct properties and scientific names that classify them as sugars. Some of the more common of these sugars are sucrose, glucose, dextrose, fructose, lactose, and maltose.

Sucrose is the most abundant of the plant sugars. It is found in sugar cane, sugar beet, maple tree, maize or Indian corn, sorghum grass, and palm trees. In all of these, the problem is to extract the juice and then from this to extract the sugar crystals. The crystals are then refined into sugar. When refined, the sugar from the sugar cane and the sugar from the sugar beet are both colorless, odorless, have equal sweetening power, and cannot be distinguished from each other by chemical analysis.



sis. Each of these sugars, so refined, is composed of 99.8 per cent sucrose.

Glucose is a low grade plant sugar, and is not so sweet as sucrose. Its commercial form is cheaper than sucrose and it is used as a substitute for sucrose in candies, jams, and syrups. It is not used much for cooking purposes in the home. Fructose is fruit sugar. Dextrose is commercial grape sugar. Lactose is milk sugar, and maltose is malt sugar.

Saccharin, which is sometimes used for sweetening purposes, is not a sugar although it is very sweet. It is a coal tar product and has no food value. It is sometimes used as a substitute for sugar in a physician's prescription.

### **Heavy Consumption in the United States:**

Because of its own natural resources and because of its close relations with the great sugar producing areas of the world, the United States is one of the greatest sugar consuming countries of the world. The average consumption of sugar in this country is about one hundred pounds per person per year. In other countries where the standard of living is lower and where the conditions of life are more difficult, the per capita consumption of sugar is much less.

### **Dangers of Heavy Consumption:**

This heavy consumption of sugar brings with it

certain health dangers. Sugar is a carbohydrate a heat and energy food, like the cereals. We have already noted the heavy consumption of corn and wheat in the United States and now we must add to that account a heavy per capita consumption of sugar. It should be obvious that with a heavy cereal consumption, a heavy sugar consumption is not only unnecessary but also a menace to health. The excess calories are stored up as fatty tissue both muscular and organic, which puts additional strain on the body systems. Life insurance statistics show that excess weight is as much a handicap to longevity as some diseases. Many companies will not insure people who are more than a certain amount overweight. A person who is markedly overweight is not a good health "risk."

In this connection it is interesting to note that during the fifty years, 1875 to 1925, during which period there was a marked decrease in death from contagious diseases, vital statistics for New York City show an increase of almost 200 per cent for heart disease, over 600 per cent increase in diseases of the arteries, and over 1100 per cent increase in diabetes. It is not positively known whether or not the craving of the diabetic person for sugars and starches is merely a symptom of the disease, or whether the use of excess sugar may have led to the disease, but the figures are suggestive of close relationship.



*Diagram showing the approximate composition of certain typical foods, expressed in per cents*

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## Place of Sugar in Our Diet:

In thinking of the place of sugar in the normal diet, we must consider it in all of its forms—as a sweetening substance in beverages, and in pastry, desserts, candies, and sweet chocolate. It is probable that the average person in the United States gets sufficient carbohydrate from the various forms of cereals in his diet. In view of this fact we can well afford to partake lightly of sweets. Avoid the candy-munching habit, excess eating, and the eating and drinking of too many soda fountain concoctions. Take them occasionally and in moderation. This applies particularly to growing youth who needs protein for muscle building and the mineral substances for bone-building that are found in milk and fresh vegetables. Sweets following meals are to be preferred to sweets in between meals or just before meals, when their effect is to destroy the appetite for more substantial forms of foods. When eaten after meals, sweets are not likely to be taken in too great quantities.

The eating of too much sugar, especially if it be in concentrated form like candy, may prove irritating to the alimentary canal. Evidence of this occurs in various forms of indigestion caused by the formation of excess acid in the digestive tract. This acid comes from fermentation brought about by the presence of excess quantities of sugar.

The non-nutritive value of sugar may best be illustrated by comparing milk and sugar. A cup of milk and  $1\frac{2}{3}$  tablespoonsful of sugar will contribute the same number of calories. The sugar is 100 per cent carbohydrate. It contains no protein, no minerals, and no vitamins. The milk, on the other hand, contains the same amount of calories of heat and energy and in addition, protein, animal fat, mineral matter, and a number of vitamins.

It has been estimated that of the total food consumption of the people of the United States, wheat supplies twenty-five per cent of the total calories, dairy products supply fifteen per cent, sugars thirteen per cent, corn seven per cent, oils and fats four per cent, potatoes three per cent, and poultry and eggs two per cent. Among the meats pork is highest with thirteen per cent and beef next with five per cent. It must be remembered that the percentages are of calories supplied, not of amounts of the various foods eaten.

### **An Editorial:**

The following editorial from one of the greatest of our daily newspapers indicates the modern trend in eating:

#### **GOING IN FOR "GREENS"**

As the old American diet of salt pork, boiled potatoes and cornmeal (or bread) recedes into history, it seems that the nation is not, as one man, turning to pastry, let



tuce sandwiches, and soft drinks in its place. Despite the diatribes that have appeared against substitutes for the "filling" food of the America that is passing, there are signs of sanity expressed in terms of more fresh vegetables and milk, more vitamins and fewer calories. To be sure, dietitians are not agreed about the best normal diet, but the tendency to eat more vegetables and fruits is healthy.

The change has economic implications of such importance as to cause the Department of Agriculture to detail one of its experts to inquire into the extent to which the new diet is affecting farming. Dr. O. E. Baker, an authority on land utilization, reports that the World War marked the beginning of the new dietary—at least on a large scale—and that since, the shipments of vegetables have increased about 140 per cent, whereas population has increased only 15 per cent. This does not include local marketing (mostly by trucks) or private kitchen gardens. But it does show that we now demand vegetables in a much larger proportion than before, and that, thanks to the developments in railroad refrigeration, we are obtaining them throughout the entire year in ever-increasing quantities.

It is not so long since lettuce was looked down upon by "red-blooded he-men" as fit only for finicky city folk. There was something a little unmanly in eating mayonnaise dressing. As for sandwiches, so long as the bread was cut about an inch thick and the "filling" was a good big slab of meat, they were socially admissible. Not so, however, the little fancy doo-dabs made out of thin slices of colored bread, cemented with a lettuce leaf and a hint of salad dressing.

Now, however, we are out-rabbiting the rabbits. Where only 4,700 cars of lettuce were moved on the railways in

1916, no less than 51,504 cars were reported in 1928. Throughout the country, truck farming is spreading—not only to produce the lettuce, but also spinach, peas, beans, lima beans, carrots, beets, corn and other vegetables, of which we are eating more and more, while consumption of the lowly “spud” remains about the same. Apparently, as the quantity of vegetables goes up, the proportion of cereals declines and the relative amount of meat eaten is somewhat smaller. Probably never before has the diet of a nation been thus changed in a decade, largely owing to the spread of information about what to eat and how to prepare it. The Department of Agriculture regards the change with paternal satisfaction, and predicts better health for the years to come.

From the *New York Times* of July 7, 1930. Used by permission.

## MINERALS

### Need for Minerals:

The presence of minerals in food is essential to good nutrition. Minerals are a necessary part of cell structure, particularly in bones, and they also play an important part in the normal performance of the various functions of cells. Certain cells need more of one kind of mineral than other cells do. The red corpuscles, for instance, need iron, and the cells of the gastric glands need salt (sodium chloride) in order to make the hydrochloric acid used in digestion. Calcium is needed for bone building and repair and is vital to good teeth. Phosphorous is also needed for proper bone formation.

# FOOD-IRON

FOOD	HELPING	AMOUNT OF IRON
Beef (Lean)	4 oz. (570)	
Oysters	$\frac{1}{2}$ Doz. ( $3\frac{1}{2}$ oz.) (445)	
Spinach	4 oz. (432)	
Liver	4 oz. (336)	
Molasses	$\frac{1}{2}$ oz. (328)	
Wheat Bran	$\frac{1}{2}$ oz. (230)	
Egg	2 oz. (180)	
Bread, Boston Brown	2 oz. (180)	
Bread, Graham	2 oz. (150)	
Strawberries	6 oz. (144)	
Potatoes	3 oz. (117)	
Oatmeal	1 oz. (114)	
Peas, Green	2 oz. (102)	
Fish	4 oz. (101)	
Bread, Whole Wheat	2 oz. (96)	
Prunes	1 oz. (90)	
Dates	1 oz. (90)	
Onions	4 oz. (72)	
Banana	1 (4 oz.) (72)	
Cabbage, Raw	2 oz. (66)	
String Beans	2 oz. (66)	
Raisins	1 oz. (63)	
Pineapple	4 oz. (60)	
Milk, Whole	$\frac{1}{2}$ pint (60)	
Almonds	$\frac{1}{2}$ oz. (59)	
Bread, White	2 oz. (54)	
Tomatoes	1 (4 oz.) (48)	
Sweet Potatoes	3 oz. (45)	
Lettuce	2 oz. (42)	
Beets	2 oz. (36)	
Carrots	2 oz. (36)	
Apple (Fresh)	1 (4 oz.) (36)	
Peanuts	$\frac{1}{2}$ oz. (30)	
Turnips	2 oz. (30)	
Cornmeal	1 oz. (27)	

Many Foods Contain Iron.

Compare the Amounts

of Food-Iron in the

Customary Helpings

of Some of





























the Commoner Foods.

[An Educational Exhibit by the American Medical Association.—(49) 39]

courtesy, Bureau of Investigation of the American Medical Association.

NOTE. In the third column of the above table the unit of measure is 1/100 milligram (approximate).

# FOOD - CALCIUM


FOOD	HELPING	AMOUNT OF CALCIUM (LIME)
Milk	$\frac{1}{2}$ pint (300)	
Cheese	1 oz. (279)	
Buttermilk	$\frac{1}{2}$ pint (262)	
Cauliflower	4 oz. (147)	
Dandelion	4 oz. (126)	
Figs, Dried	2 oz. (97)	
Beans, Dried	2 oz. (96)	
Orange	1 (6oz.) (81)	
Spinach	4 oz. (80)	
Bread, Boston Brown	2 oz. (77)	
Maple Syrup	$1\frac{1}{2}$ oz. (48)	
Celery	2 oz. (47)	
Rutabaga	2 oz. (45)	
Egg	2 oz. (40)	
Carrots	2 oz. (34)	
Bread, Whole Wheat	2 oz. (30)	
String Beans	2 oz. (28)	
Cabbage, Raw	2 oz. (27)	
Bread, White (Milk)	2 oz. (26)	
Oatmeal	1 oz. (21)	
Wheat Bran	$\frac{1}{2}$ oz. (18)	
Peas, Green	2 oz. (17)	
Bread, White (Water)	2 oz. (16)	
Meat	4 oz. (15)	
Tomato	1 (4 oz.) (13)	
Wheat, Entire	1 oz. (13)	
Potatoes	3 oz. (13)	
Cornmeal	1 oz. (6)	

Calcium (lime) constitutes a larger proportion of the body-weight than does any other "inorganic" element.

A definite amount is lost daily and must be replaced by calcium-containing foods.

The growing child needs more calcium daily than does the adult.

The Daily Amount of Calcium recommended for Children and Adults is shown below:

DAILY AMOUNT PER CHILD (1200) { 

(Equal to 1 quart of Milk)

DAILY AMOUNT PER ADULT (600) { 

[Source of Investigation of the American Medical Association—p. 4] 40

*Courtesy, Bureau of Investigation of the American Medical Association.*

NOTE. In the third column of the above table the unit of measure is one milligram (approximate).

### Place of Minerals in Our Diet:

Minerals are not measured in calories as other foods are since they furnish no heat or energy. Yet they are necessary to life, for they promote proper growth and functioning of the cells. They are generally found in protein-containing foods, particularly in milk, meat, fish, vegetables, and fruit. If care is taken to choose a balanced diet, enough mineral matter will be found in the foods selected to satisfy the body needs without making any effort to eat mineral-containing foods. Common salt (sodium chloride) is the only one not found plentifully in a mixed diet but this deficiency is remedied by the fact that salt is used at the table and also in cooking for seasoning purposes. Other mineral substances required by the body are the salts of iron, sulphur, calcium, phosphorous, and magnesium. Minerals are most important during the period of growth, and infant, child, and youth should be provided with a well-balanced diet that will insure a sufficient supply of mineral substance. The mineral needs of the infant are supplied by milk, which forms the major part of its diet. While a sufficient supply of minerals is most important for the young, adults too will suffer impaired health if they do not have a sufficient supply of minerals in their diet.

Iron is required in the body. Its chief value lies in its presence in haemoglobin, the red pigment



which gives the red corpuscles their color. Haemoglobin in the red corpuscles enables them to carry oxygen to the tissues. A proper supply of oxygen for the cells of the tissues is necessary for the combustion or burning of the fuel foods. Absence of a proper supply of iron in the blood leads to a reduced amount of haemoglobin and consequently less oxygen for the tissues. This condition is known as anemia, and its cure lies in increasing the iron and haemoglobin content in the red corpuscles. A form of neuralgia, associated with anemia, is usually cured by an increased supply of iron for the blood. Minute quantities of copper are also required with the iron before the body can use it properly.

Egg yolk and green vegetables which have a rich supply of minerals, including iron, are valuable in preventing anemia. Iron is essential to the green leaf plants, which secure it from the ground. Other food sources of iron and copper are to be found in meats, dried peas, beans, and whole grain cereals.

Calcium, found largely in milk and the green leaf vegetables, plays an important part in the "clotting" power of the blood and is essential to the proper growth and development of the teeth and the bones. Calcium has been previously treated under vitamin D, "the calcium helper." The presence of some phosphorous is needed in order that



the body may use its calcium supply. Rickets have been produced in experimental animals when an ample supply of calcium but a low supply of phosphorous was provided. Milk contains calcium and phosphorous in the proper proportion for the body needs.

Iodine is required in minute quantities in order to prevent a disturbance in the functioning of the thyroid gland. In regions where iodine has been exhausted from the soil and the drinking water, (generally in places remote from the ocean), goitre and cretinism are sometimes prevalent. Goitre shows itself as a swelling on the neck and is caused by an enlargement of the thyroid gland. Cretinism is a form of retarded development both mental and physical. (See Deficiency Diseases, pp. 158-162). Both goitre and cretinism are caused by a lack of iodine in the food or in the drinking water. The deficiency is often remedied by adding small quantities of iodine to the water supply. Iodized salt is sometimes used, but the amount of iodine so supplied is not sufficient in itself to insure enough iodine for the needs of the body. Salt in its natural state contains iodine, but it is lost in the modern processes of refining for table use. Iodized salt merely has restored to it the iodine that was lost during the process of refinement. Sea foods generally contain small quantities of iodine.

## CELLULOSE

### Place in Our Diet:

Cellulose is a substance found in vegetables, fruits, and the hulls of cereals, which is not digested by man and, therefore, has no food value as far as his nourishment is concerned. Its roughness is mildly stimulating to the walls of the alimentary canal and its bulk gives something firm on which the muscles of the intestines may contract. This helps to establish good muscle tone in these sets of muscles, and it is therefore a distinct aid to regular elimination. Here again the vegetables are more valuable than the cereals because they contain more cellulose. For the same reason, whole cereals are often preferred to the refined cereals.

## PROTEIN

### Kinds of Protein:

The chief sources of protein (muscle building food) are to be found in meat, fish, milk and its products, eggs, nuts, vegetables, and cereals. It will be noted that some of these proteins are from animal sources and others from vegetable sources. They are known as animal proteins and vegetable proteins.

People who are vegetarians, that is, who eat no meat or flesh, must get all of their protein from vegetable sources. Some vegetarians include in

their diet milk, cheese, and eggs but no meat, although the milk, cheese, and eggs are, of course, animal products. There is some dispute as to whether animal or vegetable protein is superior. An analysis of the two seems to indicate that animal protein more nearly meets the needs of human tissue requirements. There is less waste in the animal protein, in certain respects, than in vegetable protein. On the other hand, a series of physical tests given in one of our large universities some years ago seemed to indicate that the vegetarians were stronger and had greater endurance. However, our ancestors, primitive men, ate meat and as we inherit our organisms from them it seems logical to assume that meat is a natural food for man. There is this difference, however. Civilized man eats mostly the muscle cuts of the meat while primitive man ate most, if not all, of the internal organs and glands which probably contained elements of value to health. Modern science is finding much of food and health value in these organs and glands.

### **Place of Protein in Our Diet:**

There is considerable discussion as to whether too much meat (protein) is harmful or not. Some believe that too much meat is harmful to the kidneys and is poisonous to the system, causing drowsiness and lack of animation. Others believe that it

is not harmful except where the kidneys may be already weakened or diseased, and that large amounts of protein increase resistance and insure better muscular development. Countries where little or no meat is eaten are noted for the lack of muscular development of their people. However, the evidence is conflicting and no final answer can yet be given. To be on the safe side one should eat moderately of meat and maintain a balanced diet. It is generally considered advisable to eat meat only once a day.

One caution should be given to vegetarians. Because they limit their diet to fruits, vegetables, and nuts, they make it more difficult to obtain a sufficient proportion of all types of food, particularly the proteins and certain vitamins, in their daily diet. Care must be taken to see that their diet is not lacking in any respect, by eating foods that will compensate for these possible losses.

## FATS AND OILS

### Kinds and Sources:

Foods of this type may be classified as animal fats, vegetable oils, and mineral oils. Animal fats and vegetable oils may be regarded as true foods since they may be assimilated and absorbed, but mineral oils stay in the alimentary tract until they pass from the body. They are not absorbed. Mineral oils are valuable principally as aids to proper

bowel elimination. For this purpose they may be used with salads instead of vegetable oils. Fats are found in dairy products, also in fish oil, yolks of eggs, olives, nuts, and meat fats.

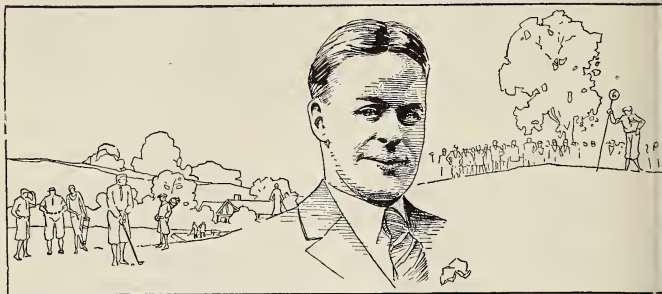
### **Their Place in Our Diet:**

Natural fat is not hard to digest but fat used in cooking, especially when it combines with something else, is difficult for proper digestion and absorption. Consequently, fried foods and pastry are hard to digest. The fat combined with the protein of pork makes for slow digestion. The body does not need a great deal of fat. Some is needed for repair of tissues. Some is consumed in the production of energy and some is a valuable aid in bowel elimination. Too much fat may cause indigestion.

## **PHYSICAL ATTRACTIVENESS AND DIET**

### **Physical Disurbances:**

It often happens that during youth or adolescence, when young persons are most particular about their personal appearance, they are annoyed and humiliated by some condition which interferes with their attractiveness. Skin eruptions or pimples are of frequent occurrence at this period of life. Other signs of disturbances are bad breath, stringy hair, a sallow complexion, or headaches. The natural question is, "What can I do to avoid these distressing things?"



*Robert T. Jones, Jr. ("Bobby" Jones), acclaimed as the world's best golfer, won the four greatest championships of England and the United States in 1930, a feat never accomplished by anyone before in the history of golf.*

*"A perfectly balanced diet, it was said, enables Jones to keep his nerves steady and make possible his deadly accuracy at crucial moments."—(The Philadelphia Evening Bulletin, Sept. 25, 1930.)*

### **Border-Line Deficiency:**

First, let us repeat our previous caution (given under vitamins) regarding border-line deficiency. It is quite possible that there is some slight deficiency of one or more of the vitamins. The lack of vitamin B<sub>1</sub> may cause disturbances that affect nearly all parts of the body, organs, glands, digestion, assimilation, and in particular the nervous system. The lack of vitamin B<sub>2</sub> (also known as G or P-P) will cause skin eruptions and will also affect the nervous and digestive systems. Vitamins A, C,



and D are similarly important for normal growth and development. In order to be sure that such symptoms are not caused by a lack of vitamins, therefore, one should eat a balanced diet, stressing particularly milk, eggs, the green vegetables, and fresh fruits. Such a varied diet will also provide for other needed elements in the food supply in adequate proportion—carbohydrates, proteins, fats, and minerals.

### **Avoid Too Much Sugar:**

Very often physical disturbances may be due to abnormal digestive or intestinal conditions. The eating of too much candy and concentrated sweets may cause indigestion by the formation of excess acid. Complex food mixtures which place an undue strain on the organs of digestion should be avoided.

### **Regular Elimination:**

Delayed elimination from the bowels favors the generating of poisons which are harmful to the body and which may cause any of the unattractive conditions named previously, particularly bad breath, skin eruptions, and headaches. *Again the emphasis is on the need for a balanced diet.* Vitamins B (1 and 2) are essential aids to good elimination and the lack of them is conducive to constipation. The cellulose of vegetables provides valuable bulk or roughage, the organic acids and the



### PHYSICAL ATTRACTIVENESS

*Is greatly dependent upon keeping the system free from poisons, and upon proper nourishment. In this matter, diet is a great factor.*

mineral salts of fruits and vegetables stimulate the organs of digestion, and some fats and oils in moderation are valuable aids to regular and easy elimination. The drinking of plenty of water, from four to six glasses a day, is also helpful to elimination through the kidneys as well as through the bowels. Poor posture tends to interfere with the blood supply to both the kidneys and the intestines and, therefore, is a hindrance to proper elimination. Persistent use of alcohol tends to cause degeneration of the cells of the kidneys, thus interfering with elimination. Depressing emotion working through the nervous system may be a contributing cause of constipation. If you wish to

keep yourself physically attractive, and efficient as well, you must try to keep your system clean and free of poisons caused by faulty elimination or improper diet.

## ACID-FORMING FOODS

Foods may be classified according to the chemical effect which they produce in the blood stream. The residue of food after metabolic changes is sometimes referred to as an "ash," literally after "burning" by oxygen. This ash may be either acid-forming or alkaline-(base)-forming according to the chemical composition of the food eaten. During recent years considerable attention has been paid to acid-forming foods and their possible harmfulness to the body. This can be understood readily when we recall that the fluids of the body, except the gastric juice, are normally alkaline and each must have a definite degree of alkalinity for good health. The absence of this alkalinity is called "acidosis." It is a condition to which children particularly are subject. Foods that cause a loss of alkalinity are known as acid-forming foods. The common danger lies in the eating of too much acid-forming food. By improper eating, it is easily possible to create too much acidity in the body, but it is hardly possible to create too great alkalinity. Foods which are acid when eaten may have an alkaline effect after assimilation and absorption,

because of the chemical changes they have undergone in the body. Thus the juices of oranges, lemons, grapefruit, apples, and the like are not acid-forming *in the blood*. The acids that they contain, such as citric and malic acid, are broken up during digestion and do not reform. Most of the fruit acids are not in any degree acid-forming in the blood, the only exceptions being grapes, prunes, plums, and cranberries. The real point involved is that of the mineral salts contained in foods. Some of these mineral salts can and do form acids and may give rise to acidosis unless other substances in the food neutralize them. Foods that have a high content of sulphur or phosphorous can be acid-forming. Foods that have a high content of calcium, potassium, or sodium are alkaline in effect.

You are safe in avoiding acid-forming foods as a rule, if you choose those that are desirable from the point of view of containing vitamins and calcium. A liberal use of such foods will usually neutralize the effects of whatever acid-forming foods may be present among the other portions of your diet. It should be emphasized that all the citrus fruits (orange, lemon, grapefruit, lime, kumquat, tangerine), and also apples, which are acid in taste, are not acid-forming in the blood. They are all protective against acidosis.

In most cases a varied and balanced diet with

not too great a proportion of any single food or type of food will be sufficient to protect against too great body acidity.

From the standpoint of their general availability and prominence in our diet, including the factor of bulk, the foods most favorable for alkaline or base-forming purposes are potatoes, apples, bananas, raisins, oranges, cantaloupe, and tomatoes. From the same point of view, the foods most strongly acid-forming are meats, fish, eggs, and cereals. The tendency of many people is to overuse the acid-forming foods. The use of fruits helps to overcome the undesirable effects of this tendency.

Acid-forming foods in the order of their acid-forming contribution are: Egg yolk, fish, meat, oatmeal, whole wheat, rice, crackers, corn, and peanuts. Other acid-forming foods (not ranked) are: Oysters, sardines, beef, chicken, salmon, pearl barley, pork, veal, ham, mutton, halibut, trout, perch, soda crackers, bread, and walnuts.

Base-forming foods in the order of the alkalinity of their "ash" are: Dried lima beans, dried beans, raisins, almonds, beets, carrots, celery, chestnuts, cantaloupe, lettuce, potatoes, dried peas, dried currants, oranges, bananas, lemons, cauliflower, peaches, raspberry juice, cherry juice, cabbage, apples, radishes, turnips, milk, and asparagus. Other base-forming foods (not ranked) are: Molasses, parsnips, dates, rutabagas, cucumbers, coconuts,



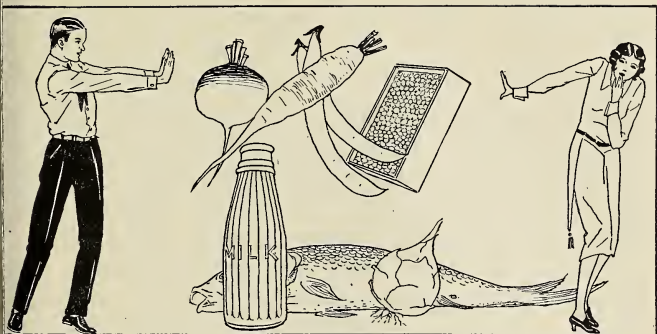
pineapples, sweet potatoes, string beans, mushrooms, onions, and olives.

Neutral or non-ash forming foods are: Oils, fats, and sugar. Milk is almost neutral, being only slightly base-forming.

## FOOD IDIOSYNCRASIES

By a food "idiosyncrasy," we mean a condition in which a person is "sensitive" to, or cannot eat, a wholesome food which generally causes no inconvenience to other people. This condition is called food allergy, and it is estimated that at least one person out of every ten is so afflicted. People are sometimes sensitive to and cannot eat, without harmful results, the most common and most wholesome articles of food, such as milk or eggs. Even the smallest quantity of one of these wholesome foods would make some people violently ill. It affects them like a poison. Other people are affected by the less common articles of food, perhaps fish or strawberries. It can be any food, and to find out just what it is that makes such a person ill is sometimes most difficult. Generally it is one of the proteins. There are all degrees of "sensitivity." Not all people are made *violently* ill by a small quantity of the food to which they are sensitive. It may affect them only mildly, and we say that it "disagrees" with them. These are purely individual traits, and they vary with each person. Ninety





### FOOD IDIOSYNCRASIES

*There are some wholesome foods that are poisonous to certain people. Ninety per cent of us have no food idiosyncrasies, however.*

per cent of us, the lucky ones, have no such food peculiarities and need not worry about them.

Food allergy frequently leads to chronic diseases such as hay fever, asthma, chronic coughing, hives, eczema, swellings of the face, hands, or feet, stomach and intestinal disturbances, kidney and bladder troubles, convulsions, headaches, weakness, or dizziness. People who are so afflicted have often been relieved by discovering that the affliction occurred after eating a certain kind of food and, thereafter, avoiding that particular food. In more complicated cases, the services of a physician are necessary to discover the cause. Where the food is not a very common one, such as strawberries

for instance, the victim can stop eating strawberries and be cured. But where the food to which the patient is sensitive is a very common one, like milk, it may be necessary to overcome the weakness. Physicians have been successful in curing such cases by a systematic course of treatment, so that eventually the person previously afflicted may thrive on the food that once reacted against him.

There are other kinds of allergy besides food allergy. Some people may be afflicted by substances carried in the air—dust, smoke, fumes, particles of plants, and tiny particles from birds or animals. The cause of allergy is thought to be a matter of heredity.

## DIETING

Of recent years a fad has grown among women for slim figures and, as a means of attaining this end, many women have cut down on the amount and the kinds of food that they eat. This is probably true also of men who are overweight. Reductions in weight are often advisable, but it should be remembered that unless such reduction is done on the advice and under the guidance of a physician, considerable harm may be done.

Many people go to unwise extremes. Cutting down the total amount of food consumed, reduces the supply available for repair of the tissues and for energy. Special diets which eliminate certain

foods entirely, may be very harmful to people of a particular type. In all of this the expert advice of a physician should be sought.

It is foolish to try to cut one's figure to a given pattern or style, as one would cut a suit of clothes out of cloth. Some people are by nature slender, others are inclined to be short and heavy set. *It is dangerous to try to change one's physical type.* This applies equally to overweight or to reduction. A great deal depends upon the endocrine glands and one's rate of metabolism. For this reason some people can eat a great deal and stay thin, while others eat less and grow stout. One should never take any kind of gland extract for weight reduction or indeed for any other purpose unless it is prescribed by a reliable physician. Moderate exercise is beneficial for reduction, provided one needs to reduce and is in a physical condition to stand it without injury. It serves, however, to increase the appetite for more food.

One should always eat in moderation. It is said that more people die of the effects of overeating than die by starvation. Eating as well as drinking to excess may bring one to an early grave. Do not dig your grave with your teeth." "Eat to live, rather than live to eat."

## FOOD FAKERS

As the new knowledge of nutrition revealed by



### THE FOOD FAKER

*The "Indian herb" medicines that "cured" everything are being supplanted by fake food doctors with pet theories of diet.*

modern science has shown how diet may be used as a means of correcting ill health, there has been a tendency for frauds and charlatans to shift from patent medicines to the new field of patent foods or proprietary foods. Of course almost any canned or packed food is a proprietary food but the ones to which we are referring are those that advertise extreme claims for their products as health foods.

One health food advertised pictures of a very fat "healthy" baby as proof of its value for babies. Investigation proved that although the baby was fat, it had rickets due to a lack of vitamin D. Poor bone development was not so evident as the weight of the baby. Other foods are advertised for their vitamin value. You probably can get just as much

vitamin content by consulting food tables and buying ordinary food at ordinary prices. Some foods are advertised for diabetics, others as brain foods, some to make us thin, others to make us fat, some for vitality, some for beauty, others to prevent acidosis, blood pressure, Bright's disease, or dyspepsia. The game of the food faker is to take some scientific truth and then to use it beyond all proportion in claims for his brand of food. Proprietary foods must be made from the same things ordinary foods are made—proteins, carbohydrates, fats and oils, mineral matter, and vitamins. They cannot accomplish anything that cannot be accomplished by the same substances in ordinary food. The worth while exceptions are known to physicians, who will recommend them when needed.

The great objection to the proprietary foods that make extravagant claims lies in the fact that they are untruthful. People are led to believe that they need them, particularly if they are ill, and are, in this way, induced to waste money on them. Frequently treatment from a physician is postponed and there is always the cruelty of deceiving someone who is ill. As the composition of many of them is unknown, there is always the possibility of actual harm being done. Therefore, avoid patent or proprietary foods for which extravagant or extreme claims are made, without first consulting a reliable physician.

## PRACTICAL APPLICATIONS

**For Effective Study:**

1. What is a vitamin?
2. Name the two classes of vitamins.
3. What is a "food deficiency" disease?
4. Which vitamin is:
  - (a) "the calcium helper?"
  - (b) particularly essential to growth?
  - (c) protective against scurvy?
  - (d) protective against beri-beri?
  - (e) protective against pellagra?
5. What causes rickets?
6. Name some of the chief sources of each of the vitamins.
7. What other symbols are sometimes used for vitamins B<sub>1</sub> and B<sub>2</sub>?
8. Describe briefly the proper place of each of the following in our diet and give both benefits and limitations, if any:
  - (a) cereals
  - (b) sugar
  - (c) minerals
  - (d) cellulose
  - (e) protein
  - (f) fats and oils
  - (g) vegetables
9. Name three nutritive values that may be derived from eating "whole grained" foods.

**For Observation or Investigation:**

1. What are some of the advantages of variety in diet?
2. Wherein lies the danger of a lack in variety of diet?
3. Describe the possible causes and results of borderline deficiency.
4. What is meant by "refined" foods? What are their advantages and disadvantages?



5. How may nutrition and diet affect one's physical attractiveness?
6. What precautions should be observed in relation to:
  - (a) dieting?
  - (b) patented or proprietary foods?
7. What relation have acid-forming foods to health?
8. What is meant by food allergy? food idiosyncrasy? sensitivity to protein?
9. Why have fruits and vegetables become so prominent in our diet in recent years?
10. What are some of the arguments for and against vegetarianism?

#### For Health Habit Formation:

1. Balance your meals:

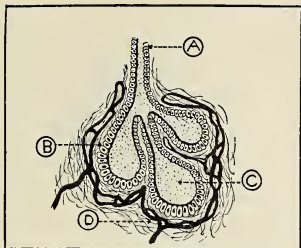
Proteins	Fats and Oils
Carbohydrates	Minerals
Vitamins	
2. In particular, avoid excess of carbohydrate:
  - Cereals
  - Candies and sweets
3. Eat foods that aid regular elimination:
  - Fruits and vegetables
  - Whole grains
  - Fats and oils (in moderation)
4. Eat plenty of fresh fruit, fresh vegetables, eggs, and milk.
5. Avoid too much meat.
6. Avoid too much acid-forming food.
7. Avoid food "cures" and proprietary foods making extreme claims.
8. If you follow a vegetarian diet, be sure to secure enough of the right kinds of vegetable protein.
9. Remember: *Variety* = Vitamins.

## IX. THE MAGICIANS OF HEALTH AND PERSONALITY

A magician, you will recollect, is one of those chaps who waves a wand, says "Presto!" and accomplishes strange and incomprehensible things. We have a set of organs in the body about which not a great deal is definitely known at the present time. What we do know about them, however, leads us to suspect that they wield a vital influence in our mental and physical lives. These organs are the so-called "glands of internal secretion." Disturbances in the normal functioning of these glands cause profound changes in personality and growth. As we shall see, they are often responsible for the differences between giant and dwarf, between normal mind and gravely retarded mental development. Differences in traits of character or "disposition" are often thought to be attributable to their influence. By some authorities they are regarded as "personality makers."

### Glands:

A gland is an organ that has the power to extract some substance from the blood stream and change it into a different substance that is needed in some tissue of the body. An easy illustration is found in the salivary glands. They take something from the blood and from it manufacture

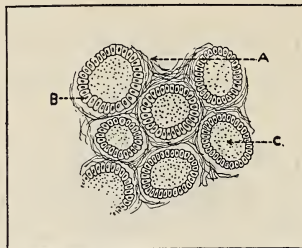


### GLAND AND DUCT

*Compare the cross-section of this gland with the figure of the cross-section of a part of a ductless gland. A.—duct; B.—cells which produce the secretion from substances taken from the blood, then pass it to C; C.—sacs containing secretion. This passes into duct, and thence to place where its work is performed; D.—capillaries which supply blood to the cells (B).*

saliva, which is needed for the proper digestion of food. There are other glands located at various places along the alimentary canal, the purposes of which are to manufacture various fluids or juices that are required for the digestion of food.

There are two great classes of glands. The first and more easily understood are those that have tubes or ducts that are connected with some outer surface of the body, like tear glands, or the gall bladder, which is indirectly connected with the outer surface of the body by means of the alimentary canal. There are other glands that have no ducts or connection with outer surfaces. These



### SECTION OF A GLAND OF INTERNAL SECRETION

*A.—lymph; B.—cells of gland; C.—sacs containing the secretion. The cells produce the secretion and store it in the sacs (C). Eventually the secretion finds its way out between the cells (B) to the lymph (A), thence to the blood stream. Such secretions are known as “hormones” in the blood stream. Notice the absence of any ducts.*

glands put their product into the blood stream without the aid of ducts. Because they are not equipped with ducts for conveying their secretion but empty it almost directly into the blood stream itself, they are often called ductless glands. They are referred to as glands of internal secretion or endocrine glands.

### Glands of Internal Secretion:

There are a number of these glands located in different parts of the body. We shall consider some of them individually later. In certain respects, however, they are so similar that they are frequently thought of as parts of a system—the en-

ocrine system. Each of these glands is well supplied with blood from which it takes what it needs for the production of its own particular internal secretion. The secretions of these ductless glands are called "hormones." They are substances of a chemical nature, made in the cells of a gland in one part of the body and carried by the blood stream to other parts of the body where they have special functions to perform.

### **Hormones:**

Each gland produces at least one hormone, some more than one. The hormones of the various glands influence each other as well as the various functions of the body. The exact influence of each of the various hormones has not been absolutely determined. Science is still in the process of unveiling the vital importance of these substances and their contribution to our health and development. There is good evidence for believing that many of the bodily functions are controlled or vitally influenced by the presence (or absence) of these hormones in the blood stream—growth and development of the skeleton, muscle tissue and fatty tissue, sex organs and their functions, and personal characteristics (both physical and mental). As previously pointed out, hormones have an influence on the rate of general metabolism and on particular types of metabolism such as that of carbohydrates and of calcium. It is

known that endocrine secretions may have an influence on blood pressure and the elasticity of our blood vessels. It can easily be seen, therefore, how important a part is played by the endocrine glands in their effect upon our general health.

The nervous system has some control over bodily functions and also affects the functioning of the endocrine glands. On the other hand, the endocrine glands influence the functioning of the nervous system in certain respects. The two systems, the endocrine system and the nervous system, are therefore closely related in their control of many bodily functions.

### **The Glands of the Endocrine System:**

The glands that are generally regarded as belonging to the endocrine system are:

(1) The thyroid gland, located in the front part of the neck, has a great influence on metabolism and upon the nervous system. An abnormal increase in the size of this gland is known as goitre. This condition does not necessarily mean that there is any interference with the functioning of the gland except as the growth presses upon throat tissue and, by its presence, interferes with the throat tissue. Under-secretion of the thyroid frequently results in mental backwardness (cretinism), and lack of size and physical development. Over-secretion in the thyroid gland results in a great stimu-

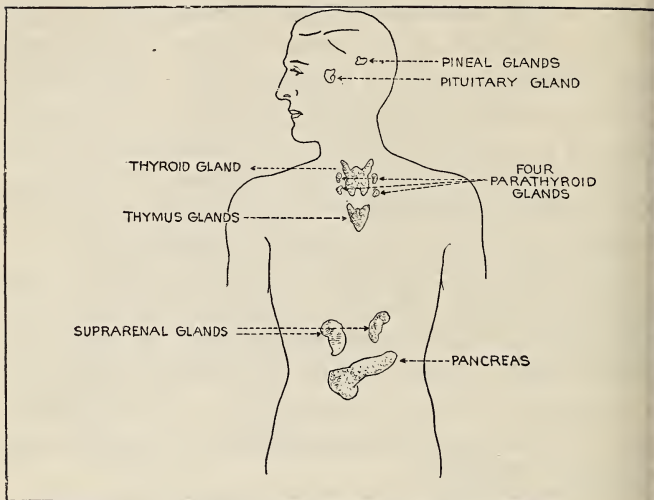


lation of the nervous system and marked increase in the rapidity of the heart action, restlessness, overexcitement, and in distinct cases, a protrusion of the eye balls (exophthalmic goitre). The parathyroid glands are located in the neck on each side of the thyroid gland. Their function is not absolutely known but their removal results in a loss of muscle tone to the point where death results.

(2) The pituitary gland at the base of the brain influences skeletal growth, producing "giantism" in over-secretion cases and "dwarfism" in under-secretion cases. Other defects may cause obesity, or a condition of being exceedingly fat. The pituitary gland seems to have some influence on muscle tone and blood pressure.

(3) The sex glands not only secrete the reproductive cells (external secretion) but also certain internal secretions that are emptied into the blood stream. These internal secretions of the sex glands are believed to be responsible for the different physical and mental characteristics of the two sexes that we ordinarily think of as "masculine" or "feminine." The action of these glands seems to be held up by the internal secretions of the other glands until the stage of adolescence is reached.

(4) The pancreas is located on the right side of the body just behind the stomach. It is attached to the small intestines. It is a gland of both external secretion (pancreatic juice) and internal se-



### THE ENDOCRINE SYSTEM

*This chart shows the location of the various glands of internal secretion (the "ductless glands")*

cretion. The internal secretion of the pancreas is called insulin. Insulin is necessary for the proper metabolism of the carbohydrates. Insufficiency of insulin often results in a disease called diabetes. This has previously been discussed under "Deficiency Diseases," pages 158-162.

(5) The thymus gland in the front part of the lower neck and upper chest is not definitely known to produce an internal secretion, although it is believed to have some influence on both skeletal

and sexual development. It generally disappears (atrophies, or "dries up") after adolescence. By some it is regarded as the gland of youth or youthfulness, possibly accounting for the presence of certain youthful characteristics in people who have actually passed in years beyond the stage of youth. On the other hand, it is stated that a high percentage of criminals have retained their thymus glands after maturity, an indication perhaps of the lack of a mature mind in an adult body.

(6) The pineal gland located in the brain is not definitely known to produce an internal secretion, although disease of this gland seems to produce too early physical and mental maturity, too early sex maturity, and in some cases extreme fatness or obesity. The exact function of the pineal gland is not known to the medical profession.

(7) The adrenal (sometimes called suprarenal) glands are located directly above the kidneys. They are perhaps most interesting to study of all glands. They produce hormones called adrenin and adrenalin. These glands are closely associated with the nervous system, just as the thyroid is. They have a most peculiar function in enabling the body to meet an emergency. Mental states of anger, the anticipation of a struggle, a fight, fear, and the need of flight for safety seem to be reflected in an increased outpouring of the adrenal secretion that helps the nervous system to get the body ready.

## Meeting An Emergency:

What happens? What is the nature of this bodily preparation in which the adrenal glands play so important a part? Super-strength and abnormal energy are made possible by these glands. "I don't know how I ever did it" is a frequent expression of one who has achieved an unusual physical feat under the stress of fear or other great excitement. This is done by supplying more blood and an increased supply of oxygen in the blood to the voluntary muscles that are about to act. This in turn was brought about by a dilation in the size of the blood vessels of the lungs and in the walls of the heart, an increase in the rate of the pulse and of the rate of respiration, and an increase in the blood pressure. There is a contraction of the walls of the blood vessels in the alimentary canal, and this constriction forces the blood to the voluntary muscles. This explains that "sick feeling in the pit of your stomach" in a moment of great fear or other excitement! The blood vessels in the voluntary muscles swell with the increased supply of blood.

During the stress and strain of excitement or during an increase in muscle activity, the liver releases an increased amount of glycogen or blood sugar into the blood stream. This glycogen makes possible the production of energy in the muscles and, most wonderful of all perhaps, there is an



### AT THE CIRCUS

*The difference between dwarf and giant is the result of disturbance in the normal functioning of the endocrine glands.*

increase in the *clotting power* of the blood, in order to prevent too great loss of blood, if necessary, in case of a wound being received! The secretions of the adrenal glands in this manner help to prepare the body to meet an emergency.

### Hygiene of the Endocrine Glands:

The far-reaching influences of the endocrine glands are so important, that one feels almost helpless before their power. Such tiny bodies and such fine and delicate adjustments have power to mold and influence not only the physical growth and condition of our bodies, but our mentalities and personal characters as well.

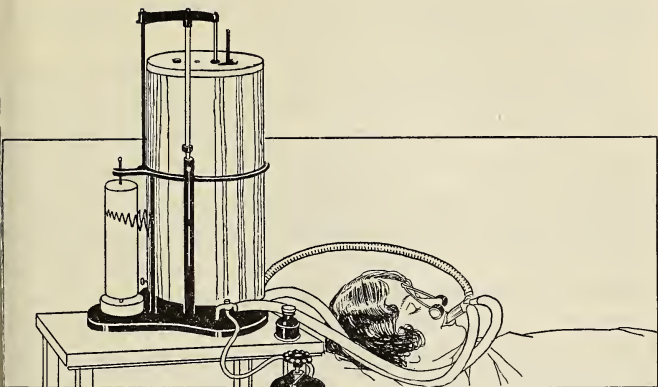


We are not altogether helpless, however. The experimentation of modern science is continually bringing new light and knowledge to our aid. Medical treatment frequently results in an improvement of the functioning of the endocrine glands. Insulin has been discovered and made available for diabetic troubles, and some control has been gained over the thyroid glands. In some cases extracts of glands taken from animals are used to make up for the lack of some internal secretion of the endocrine glands in human beings.

The internal secretions of the endocrine glands have so vital an influence on our health and are so delicately balanced, however, that it must be obvious to anyone, that no extracts or remedies for glands should be taken without the advice or services of a physician.

As previously indicated, the nervous system influences the action of some of the endocrine glands. Indirectly, it may affect almost all of them. We can avoid overstimulation of these glands, particularly the thyroid and the adrenals by avoiding too great or too frequent mental strain or excitement. Improvement in the general health of the glands may be obtained in many cases by the practice of good *personal hygiene*. In other words, care of the endocrine glands may be exercised by good general care of the whole body, physical and mental. General knowledge of glands will aid in this.





### TESTING THE THYROID

*This machine is called a "basal metabolism" tester. Its purpose is to reveal any possible disturbance in the normal functioning of the thyroid gland. You will hear occasionally of people who have submitted themselves to a "basal metabolism" test. This is the apparatus used for it.*

### Relation to Mental Hygiene:

The close relationship existing between the nervous system and the normal functioning of the endocrine glands points to the necessity of good hygiene of the nervous system as a particular aid to the hygiene of the endocrines. The two systems influence each other. Bad nervous control or poor mental hygiene causes undesirable effects on the system of internal secretion, and this in turn causes

added nervous strain, and so a "vicious circle" of undesirable effects is created.

You have noted in one of the preceding paragraphs (under "Meeting An Emergency" p. 270) that great bodily changes take place under the stress of fear, or some other form of extreme excitement. It must be realized that the body is prepared to take care of such an "overload" of energy occasionally without permanent ill effects, but to subject the organs of the body to *continuous* "overloading" creates an abnormal situation that may lead to serious organic disturbances. For instance, the continual draining of the blood from the digestive tract to the voluntary muscles under the stress of overexcitement frequently leads to interference with proper digestion and nutrition, a condition commonly called "nervous indigestion." Too great a tax is also put upon the heart and the blood vessels, for which the penalty is frequently paid in later life by conditions that contribute to heart disorders or the hardening of the arteries. Such instances as these may be regarded as the bodily ill effects of a lack of practice of good mental hygiene.

### PRACTICAL APPLICATIONS

#### For Effective Study:

1. What is a gland? A gland of internal secretion? A ductless gland? A gland of the endocrine system?

2. What is a hormoné? What function is it supposed to have?
3. Name the various glands of internal secretion. Indicate briefly the nature of the function of each.
4. What is insulin?

#### **For Observation or Investigation:**

1. Describe the part played by the glands of internal secretion in preparing the body for an emergency or unusual strain.
2. How may poor mental hygiene (for example, constant worry) affect the bodily system.
3. Read Edwin Markham's *The Man with the Hoe*. To what extent, in your own opinion, may the endocrines hold the answer to some of the questions raised?

#### **For Health Habit Formation:**

1. Do not take gland extracts or remedies unless prescribed by a physician.
2. Avoid mental strain or outbursts of emotion. Do not worry.
3. Practice good personal hygiene for the whole body.

## X. THE SPRING OF LIFE

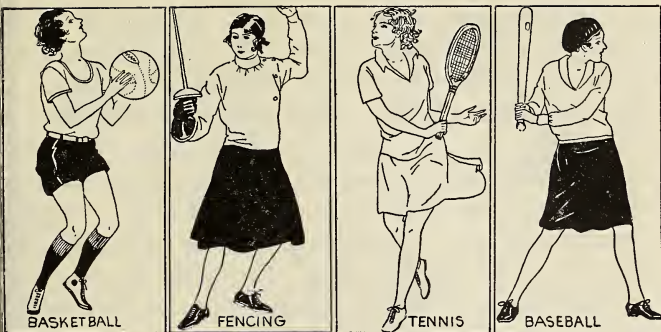
### (Adolescence)

#### Life A Continuous Process:

From birth to death life is a continuous process. At birth our powers and abilities are few. Gradually they grow more numerous, more skillful, and more powerful until they finally reach their highest point of growth or development. A man is then said to be in his prime. Gradually these powers decline, we grow less powerful, less skillful, and more feeble as old age comes on. Finally, death ends the life of the body.

#### The Stages of Life:

For ease in speech, we use certain names to indicate special periods or stages in the process of life. Thus, a young plant is called a sprout; a young dog, a puppy; a young horse, a colt; and a young human being, a baby or infant; and its period of time, babyhood or infancy. As it grows older and needs less care we call it a child and the period, childhood. The change from childhood to manhood or womanhood is called *adolescence*, or youth. A full-grown man or woman is spoken of as an adult, or mature person, and this period that of manhood or womanhood, or maturity. The period of decline in life is spoken of as old age. Old age is sometimes



### THE AMERICAN GIRL

*uses her leisure time to good advantage. She has learned that outdoor sports not only help to give a slender figure, poise, and grace, but also contribute a complexion that won't rub off! (Name some other athletic activities of girls.)*

characterized by extreme loss of mental or physical power or both. This is often spoken of as senility, or "second childhood."

These periods do not occur at the same time or age with all people. All people do not develop at the same rate. Like plants, some grow rapidly, some slowly. Likewise there is no sudden change from one period to the next. It is a matter of gradual and imperceptible growth. One does not go suddenly from one stage to another. With these exceptions in mind, we may say that infancy or babyhood lasts from birth until about the third year, childhood from the third year until about

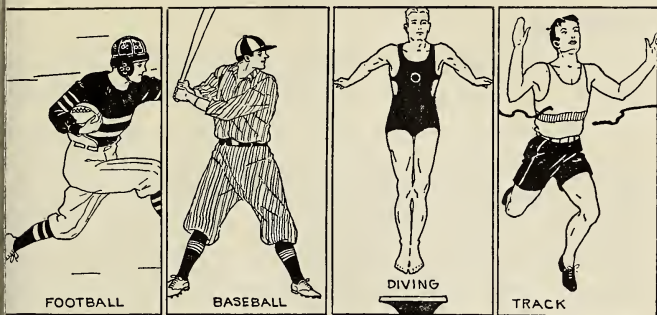
the twelfth, and adolescence from the twelfth to the fifteenth or eighteenth year. The law recognizes a person as a man or woman at twenty-one years of age by conferring the rights and responsibilities of citizenship at that time. It is probable that full mental and physical maturity comes somewhat later than that, just when it is difficult to say. Ancient Sparta did not recognize complete maturity for men until the thirtieth year. Complete physical and mental maturity varies greatly with the individual, as do, also, the stages of old age.

### **Infancy:**

This period ends about the third year. Its chief significance is in the helplessness of the infant. During the first year the baby is absolutely helpless and needs great care. How great this care is, can be realized by glancing over the topics in the chapter on The Care of the Baby. This need, of course, is not so noticeable by the end of the third year, since the child has learned to walk and to talk.

This period of helplessness is much longer with the human infant than with the young of animals, the puppy, the kitten, the chick, or the colt. In addition, the human baby is more helpless. The young of some animals begin to walk a few days after birth, can leave their mother after a few weeks, and can look out for themselves fairly well after a few months. They mature in a year or two,





### MIND AND BODY

*American youth finds in his competitive games opportunity for developing muscle, skill, and character.*

sometimes sooner. Man does not fully mature until twenty or thirty years after birth.

This longer period of infancy, childhood, and youth for man is due probably to his more complex organization and his higher type of development. Man can do more things than the animals. He is infinitely their superior. Babies and children have many difficult things to learn before they can live without their parents. Training and an all around education must accompany mental and physical development.

At the end of the third year, the human baby or infant has learned to do certain important things for himself—eating, drinking, talking, washing, and dressing. He may still need some help, but hereafter we speak of him as a child.

## Childhood:

During childhood parents still continue to provide for the child in the form of home comforts, such as food, clothing, shelter, care in time of illness, and training and education at home and at school. During this period great changes are taking place within the body. The milk teeth or first teeth are replaced gradually by the second or permanent teeth. The child grows steadily in height and weight. Habits are formed, and it is important that good health habits be begun early and practiced regularly, without exception. Good food, exercise in the fresh air, sunlight, sufficient sleep and rest are all necessary to proper growth. As he begins to associate with other children at school and at play, care must be taken to guard him against the various contagious diseases to which children are particularly susceptible.

During free time the child learns to play with others. He learns to make sacrifices and to share with others more and more as he grows older. He likes to make collections of things, to own things, and to save them, very much as his own parents save and provide things for him. During all of this time important changes are taking place within his body. These are working toward a great change of life that takes place somewhere about the twelfth or fourteenth year. This generally occurs earlier

in girls than in boys and marks the beginning of the period of adolescence.

### **Adolescence:**

The structural alterations in the body which take place at the beginning of adolescence are the first indications of the approach of manhood or womanhood. Adolescence is the change from a child to an adult. Notice the similarity of the two words—*adolescence*, *adult*. The powers or characteristics of the adult first become noticeable at this time. They grow more evident until the stage of maturity, that of full-grown man or woman, has been reached.

The various stages of life are often compared to the seasons of the year—spring (youth), summer (maturity), autumn and winter (old age). In spring, or adolescence, the first buds of manhood or womanhood appear. In summer, or maturity, man or woman is in full bloom, at the height of power and life. In autumn and winter (the approach of old age), power and life gradually fade away, just as in nature the trees lose their leaves and the flowers die.

### **Physical Changes During Adolescence:**

One of the most noticeable changes in the body at adolescence is in its growth. The bones and the muscles start to grow more rapidly than they have



### MODERN FREEDOM

*The girl of today has a wider range of interests and freedom than the girl of a century ago. This freedom carries with it the responsibility of using it for the maximum of health and happiness.*

*(A) The dignified exercise of 100 years ago.*

*(B) Today. Vigor, strength, grace.*

been growing. A boy or a girl may grow three or four inches in height during one year. They seem suddenly to grow tall.

This rapid growth in height comes in "waves," it is not uniformly or continuously the same each year. After a year or so of rapid growth, an adolescent boy or girl will grow more slowly in height for a year or so. But during this period when the growth is less rapid in height, the body seems to grow heavier and stouter. This is to be expected because the body does not seem to grow much in girth while it is growing tall. After this

interval the body will again grow rapidly in height, and then it will again pause and fill in, so to speak. These "waves" or periods of growth are often spoken of as "rhythmic" because of the regularity of their recurrence.

There is a correspondingly rapid growth of the various internal organs and systems of organs within the body. At this time the heart doubles in size during a period of seven years. There is an increase also in the size, capacity, and work of the lungs, and also in the organs of the circulatory and digestive systems. The increase in the size of these organs takes care of the extra space in the chest and abdomen caused by the growth of the skeletal system. With this increase in growth there is naturally an increase in the appetite and in the amount of food consumed.

Hair becomes noticeable under the arm pits, on the limbs, and other parts of the body. The boy or young man gets a light fuzz of hair on his cheeks. There is an increased growth of hair on the head. "Woman's crowning glory is her hair," a poet has said.

There is a change in the voice during this period. It is particularly noticeable in boys. Before adolescence many boys sing soprano in church choirs. During adolescence this changes to tenor or bass. The high-pitched voice of the boy changes to the voice of the man.

### **Mental Changes—Boys:**

Before adolescence a boy (ten or twelve years of age, perhaps) is generally interested in pets and other live things, and likes hiking, scouting, fishing, camping and playing in the woods or about the water. He usually does not care about the companionship of girls of his own age (they "spoil things"), but likes to play boys' games with boys. Boys at this age are often inconsiderate or even cruel, and are inclined to be crude, rough, or thoughtless.

As the adolescent period comes on, all this gradually changes. Besides growing big and strong, he is more interested in things that men do. He likes mechanical and scientific objects. He is interested in electricity, tools, and motors. He likes fixing things. Girls no longer "spoil things" for him. He is no longer indifferent to their presence. On the contrary, he becomes gallant, courteous, and thoughtful, and wants them and others to think well of him. He is anxious to show his strength, knowledge, or skill in sports and in useful work. He is less selfish and thoughtless. He delights in team play and coöperation. He has become manly.

### **Mental Changes—Girls:**

Before adolescence girls like to play house, give tea parties, and go calling. They do not seem to have the same interest that boys have in live pets.





*"Lovely in youthful comeliness  
Lovely all her life long in comeliness of heart."  
—Tennyson.*

Nor are they interested much in boys themselves, for the boys of their own age seem too rough and careless to appeal to them. Gradually their interests and their attitude toward boys change.

Four or five years later, after adolescence begins, while she has not grown as much in size and strength as boys of her own age, she has grown attractive in many ways. Her mind has developed and she is attracted by beautiful things. She likes music and dancing, and is interested in the many activities of the home. Her ideals are high, and she is ready to become what woman has always been—the great inspiration and companion to man. Boys as classmates in school and associates out of school are no longer objectionable. She, too, in a modest way, is anxious to help and to please—to please by

her personal appearance, to which she devotes much care, and to help her boy companions with needle and thread, or by treating a wound. She learns to sacrifice personal desires for the good of others. She has become womanly.

### What Causes These Changes?

We have learned elsewhere how the glands of internal secretion, principally the thyroid, the adrenal, and the pituitary glands, pour into the blood stream certain substances that have great influence on life and growth. While their function is not fully understood, it is acknowledged to be deep and powerful.

At adolescence the sex glands (gonad glands) develop and begin to pour into the blood and the lymph a "hormone" or "life-ferment," just as the other glands of internal secretion have been doing. These "life-ferments" or hormones of the sex glands and of the other glands of internal secretion cause the great physical and mental changes of adolescence.

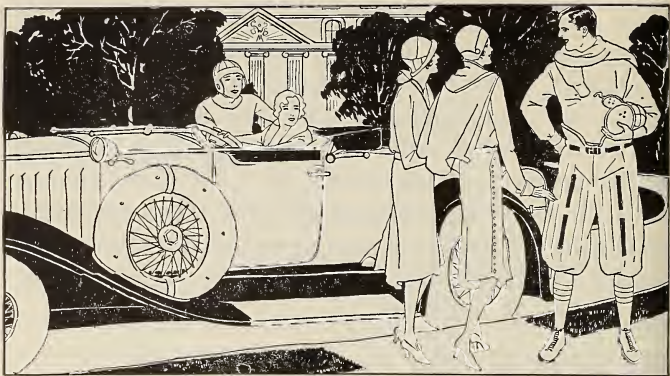
Before adolescence the boy and the girl of the same age were about the same size; if anything the girl was a little larger and a little stronger, strange as it may seem. Under the influence of these hormones which are carried by the blood and the lymph to all parts of the body, the boy becomes big, strong, husky, and man-like, but the girl develops

quite differently. While she does not grow so strong, she grows more rounded and attractive physically, more reserved, more womanly. The boy grows into manhood; the girl into womanhood.

The sex glands continue to supply this hormone or life-ferment to the lymph and the blood stream until the very beginning of old age. Thus the characteristics of manhood and womanhood which they caused to appear first at adolescence continue over the period of maturity.

### The Spring of Life:

If we may regard adolescence as the period when manhood or womanhood is starting to "bud" and spring forth, how important it is that every care should be taken of this wonderful body of ours in order that it may not be blighted or spoiled by ignorance and improper care. We must give to these beginnings of manhood and womanhood *at least* as much care and consideration as a good gardener gives to the tender sprouting of young plants and shrubs. Damage done at this time may ruin the entire development of the budding life. There must be no mistreatment, no mistakes. Be guided by the advice and counsel of your elders. When information is needed, seek it from some one whose opinion is trustworthy, your father or mother who have cared for you so well thus far, or from your family physician.



### WHOLESOME INTERESTS

*Mutual respect for the opposite sex and clean, wholesome interests are typical of the best in American youth. One should be careful not to "overdo" athletics, nor to permit any type of one-sided development to dominate to the exclusion of all other interests.*

### Hygienic Living:

It is important that during a period of great change in the body, careful attention should be given to the ordinary hygienic factors of fresh air and sunshine, exercise and rest, sleep, wholesome food, and proper elimination.

A skin rash or pimples sometimes appear at adolescence. Proper attention to the character of the food eaten and to proper habits of elimination generally correct such disorders. It is important that food be wholesome, not too rich (for example,

too much pastry) nor too highly seasoned. Bed clothing should be sufficient for warmth but not too heavy. Pay particular attention to bathing as a means of avoiding body odor. Wash carefully between the toes, under the arm pits, and the excretory organs. For normal persons a cool shower or sponge bath in the morning is advisable.

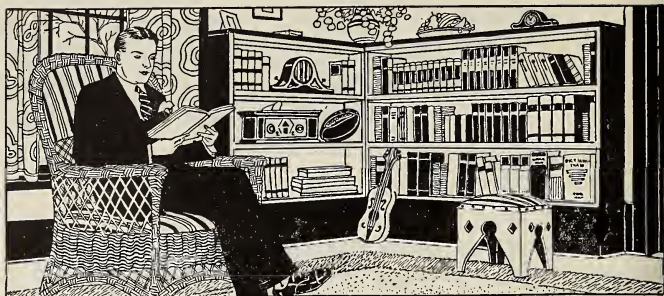
Be sure to get sufficient sleep. It is a good plan to reserve one evening at the end of the week for social activities and parties, and to devote the other evenings to lessons, reading, rest, and sleep. Training periods such as those observed by candidates for an athletic team are beneficial because they combine these many hygienic features.

Narcotics and stimulants are particularly undesirable at this stage of life's development. Therefore, avoid the use of tobacco or alcoholic drinks in any form. Practice self-control.

### **Importance of Ideals:**

After all, what do you want to be as a man or woman? What is your ideal? Sit down and write out definitely what you would like to be when you are thirty years old. Are you building for that now? With the new interests and new freedom that accompany the beginning of young manhood and young womanhood, you may lose sight of the fact that what you do *now*, largely determines what you *will be*. "The boy is father to the man."





### INVITING FOR LEISURE TIME

*"There is no frigate like a book." For relaxation, for enjoyment, for self-improvement, the habit of reading good books is one of the best investments that youth can make. They help to develop ideals.*

The coming of adolescence presents you with great wealth in the form of budding powers and abilities. Are you to throw away this physical wealth that is yours, through lack of self-restraint? Many a man or woman has wasted a fortune in health or wealth and regretted it too late. There are great temptations, strong temptations, to waste one's physical health in youth. High ideals help to overcome such temptations. Determine what you want to be and then "hew to the line, let the chips fall where they may." Make sacrifices of pleasure in order to preserve your ideals. As always, you must sacrifice the present, restrain your impulses, and exert your self-control for the real happiness of the future. A definite goal, hygienic living,



worth while companions, good books, and wholesome activities for your leisure time will help you to achieve your ideals.

### **Character Formation:**

Good character is largely a matter of training, just as a healthy body is. In the Middle Ages you will recollect that the boy who was to become a knight went through a period of physical and mental training. He was trained in self-control; the period of his training ended in fasting and vigil. The self-control that is necessary to good character and the resistance of temptation requires training and self-denial of high order.

We can definitely strengthen our moral fiber and resolution by doing certain things. Wrong actions are generally preceded by wrong or weak thoughts. Permit your mind to entertain only right ideas. Good books, the best books in our language, and good moving pictures are filled with inspirational and worthy ideas. Avoid suggestive or overexciting books, stories, magazines, or "movies," especially those that deal almost entirely with sex. Good music and wholesome hobbies or activities will help to occupy the mind with ideas of permanent worth.

Devote your leisure time to wholesome physical and mental activities. Out-of-door sports—golf, tennis, baseball, basketball, track, hiking, camping,

canoeing, sailing, bathing and swimming; coasting, skating, hiking, and gymnasium activities in the winter, are most beneficial physically and mentally. Devote your energy and your leisure time to such activities. Associate with companions who will not subject you to temptation; seek those who can contribute to your mental development and, in this way, assist in your determination to achieve self-control.

"I am the master of my fate,  
I am the captain of my soul"

(William Henley, in his poem "Invictus," or  
"Unconquered.")

Modern life demands self-control and self-denial from every young man or young woman who would be successful. Early marriages are generally unfortunate. Very often the person whom we would marry at sixteen, eighteen, or twenty years of age is entirely different from the ideal that we would seek at twenty-five or thirty. Those who marry early or in haste frequently discover that they have married the wrong person. An adolescent boy or girl has not had sufficient experience in life to pick a life companion. Those who marry young, find themselves immediately tied down by responsibilities that frequently cause unhappiness and a feeling of mental defeat.

Conditions in business and the professions demand skill and preparation from those who would

be successful. During this period of preparation for success in one's future vocation, you should have a wholesome interest in companions of the opposite sex. Associate with them and enjoy their comradeship, but do not permit your thoughts to become too serious, nor permit them to become a disturbance to your mental poise and peace. Continue to realize that for you marriage is not in the immediate future and that the present is to be devoted to development and training. In that course lies the greatest happiness.

### **Companionship:**

Since a healthy and not too serious interest in the opposite sex is normal for the young man or young woman, be sure that you select companions of the opposite sex carefully. The young man should know his girl friends in their own homes and should meet them there in preference to secret "dates," or on street corners. The home life of your companions often furnishes valuable information about their character. Occasionally go together to games, dances, lectures, good moving pictures, or theatrical performances. Do not make a show of spending much money; a real girl does not like that sort of thing and does not expect it. See that she returns to her home safely and not too late. In your attitude toward girls be a gentleman, respect her sex as you do your mother's or your sis-



### FRIENDSHIPS

*In that "plastic period" of youth, when the future life is moulded, friends should be carefully selected. The best friendships, and probably the most lasting, are those that lead to mutual self-improvement.*

ter's, by being courteous, thoughtful, and considerate.

Girls should insist on friends meeting them in their homes. A sensible girl will not expect a young man to devote all of his time or attention to her, nor will she permit herself to be put in the embarrassing position of having him spend more money than he can reasonably afford in his circumstances of life. Nor will her self-respect permit her to accept anything other than the conduct of a gentleman. Self-respect is one of the most valuable things in life.

Both young men and young women will find the



### SOCIAL ACTIVITIES

*are a necessary part of one's life and development. They should be elevating and stimulating in character, as well as subordinate and contributory to one's major aims in life.*

greatest interest and the highest inspiration in certain fine qualities of character that they may find in common with members of the opposite sex, such as mutual interests in games, sports and athletic activities, energy, ambition, ideals, humor, common-sense or level-headedness, and good taste.

Social life should not be limited to individual friendships, however. Clubs and other organizations, some "all boys" or "all girls" or others, perhaps, of mixed membership, boys and girls, are valuable means of healthy, mental, moral, and social development, provided the ideals and purposes of the organization are healthful or elevating. It is through such organizations that one often meets



friends of similar tastes and ideals and, through such contacts and meetings, fine and lasting friendships are often formed. Membership in some such group is almost a necessary part of normal development.

### The Formative Period:

At adolescence youth is in a great state of mental as well as physical change and growth. The ways of acting and thinking that are formed at that time have a powerful influence in determining the character of the rest of our lives. It is very important, therefore, that in a physical sense we do everything possible to conserve health, energy, and vitality. Youth has so much health and vitality that there is always a tendency to waste or dissipate it (as one wastes money not knowing its true value). Health may be wasted or injured by too great excess in many directions. Among them is overexertion, in games or contests. Such overexertion may be caused by too intense competition or effort, too prolonged, or too frequent competitions. As a result many good high school athletes have been "burnt-out," fine athletic careers ruined, and even permanent injuries caused to health. Other injuries that may come through the careless waste of energy by youth may be traced to continued late hours, lack of proper rest and sleep so necessary to the growth and building up of the tissues, to





### THE WAY BACK

*is long and painful. Sometimes they don't get back!*

irregular or unwise eating, and other forms of dissipation. Health and strength should be guarded with care. "Youth's a stuff that will not endure." Many have discovered the truth of this too late, after the harm has been done.

### Guarding the Emotions:

In the development of young manhood and young womanhood, new tastes, desires, emotions, and ideals are formed. It is important, therefore, that the ideals, habits, and emotions be carefully guided into right channels. Temptation is often very great, but never fail to remember that there is no short cut to happiness and "all is not gold that glitters." Beneath the lure of pleasure there is often a bad fall and ruin.

At adolescence you are growing up in mind and in character as well as in body. It is therefore to your interest to grow mentally as much and as well

as you can at this time. Many people grow physically but do not develop as they should mentally. People who are nasty, impatient, overbearing, petulant, irritable, jealous, changeable or capricious, as well as those who are shy, timid, too sensitive, and uncertain of themselves are still childish in mind or character in these respects, even though they may have grown up into physical maturity. The adult bully and the adult coward are both equally childish. They have failed to grow into proper mental maturity.

It is plain, therefore, that we should endeavor to guard and protect our emotions and mental states as well as our bodies during these formative stages of life. We can at least partly overcome undesirable emotions and ideals by deliberately associating ourselves with people and things of a higher order. Seek the company of those people who think and act as you would wish to think and act. Remove yourself from associates or conditions that tend to bring out undesirable qualities or actions.

### **Let Intelligence Rule Instinct:**

Improper thoughts about sex or continual thinking of sex will interfere with the normal development of a well-rounded character. Proper control of the thoughts and actions releases the mind to occupy itself with those things that lead to a healthy, happy, and successful personality. A surrender to

sex impulse and sex thoughts tends to interfere with a complete and harmonious development of our mental qualities, and brings out peculiar and often offensive mental traits. At the age of adolescence, thoughts of love should be associated with the love of beauty in many forms, in art, in nature, in poetry and good literature, and in love of humanity.

Reason should be applied to undesirable thoughts and impulses. "The doing of this will result in what?" "What will be the effect of this on my character? My body? My future life?" are questions that all adolescent or youthful persons should be continually asking of themselves. Your thoughts and actions now are molding your future. A noted biographer expresses this thought thus: "It is always interesting to observe in the course of a life the gradual formation of the strong strata which, hardened by time, will shape and limit a man's character."\*

The young person who wishes to get the most out of life must be guided by his intelligence rather than by animal impulses. Our lives should be on a higher plane than that of the lower forms of animal life. Man's happiness and superiority have been achieved by this use of intelligence, and it is today largely the basis of distinction between the un-

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André Maurois: (Life of) Byron (1930).

happy and the unsuccessful human beings and the happy and the successful. Getting the most happiness out of life is a question of right thinking and acting. Let your intelligence control your instincts at all times.

### **III Effects of Emotions:**

It is a matter of common knowledge and experience that certain emotions cause bad effects on the systems of the body and our general health. A fit of temper for instance will leave one feeling weak and upset, cause loss of appetite or interference with digestion. Fear may also have somewhat the same effects.

It is known that the emotions (fear, anger, pain, passion, excitement) cause increased activity in some of the glands of internal secretion. The nervous system becomes over activated, the liver pours sugar into the blood, the heart beats faster, and so on. Therefore, too great emotional activity, too frequent excitement, or too prolonged, will cause a disturbance in the normal health of the body. This will eventually bring about harmful effects particularly in the nervous and circulatory systems—heart trouble, and hardening of the arteries. Thus the value of control over the emotions is easily seen.

### **Maturity:**

By maturity we mean that period of life during

which our mental, physical, and moral powers reach their highest development. No one can say exactly when this period of life begins or when it ends. It comes gradually, imperceptibly, and passes in the same manner. It varies with individuals; in some it comes earlier, some later. Nor does complete maturity in all ways come at the same time or at the same rate. Some qualities or characteristics, mental or physical, may be retarded in their development, much depending upon the nature of the individual. Roughly, maturity covers that period of life from about the twenty-fifth or thirtieth year until the forty-fifth or fiftieth. In different individuals it may be shorter in span, start earlier, or last longer. Maturity starts to pass away when one's physical or mental powers begin to decline. Old age then gradually begins to take its place.

It is during the period of maturity that the average man or woman achieves greatest success and makes the greatest progress toward attaining the goal of his or her life. The power and ability available for this purpose is generally dependent upon the development made during the period of adolescence and youth. Those who have wasted the opportunities of proper development often live through a manhood or womanhood of disappointment.

Maturity is also a period of great opportunity for service to others. A real man or woman does





### THE FAMILY

*The family should be a unit. Work together, play together, and think things through together.*

not devote his full powers to selfish interest or ambition. The strong help the weak, the young, and the old. The greatest men and women in history, those deserving of the highest praise, are those who have in one way or another contributed most to the happiness and welfare of their fellow beings and of future generations.

### The Family:

One of the finest forms of service to others exists in the life of the family. No child can realize the amount of service performed for him by his father and his mother, until he is rendering that service for his own children. The amount of sacrifice of



all kinds cannot be realized fully until it is actually experienced.

Self-control and good character are necessary to make such sacrifices, and here again the person who has practiced self-control through adolescence and youth is in the best position to be happy and successful in raising and training happy and healthy children. Love is the keynote of the family, love of the father and mother for each other and for their children, and love of the children for them. In addition, generally, the responsibility of the father is in providing the necessities of life, such as a home, food, and clothing for the family, and the responsibility of the mother is that of caring for the children and the home. Good health of both parents is necessary if the children are to be healthy and happy. Here again the self-control and good health practices of the parents during their own adolescence and youth will have most important results. Ill health of later life can often be traced back to lack of proper self-control and judgment during youth.

### Old Age:

In some people old age is held off for a long time. Some one has used the expression "to grow old gracefully" as a great aim in life. Again the care and self-control used in conserving health in earlier years, may have much to do in determining health



### THE NOBILITY OF AGE

*Wise living in youth and middle age is often indicated in expression of fine character that we see in the faces of the aged, and in the fine physical condition that has enabled them to outlive others of their own day.*

and happiness in old age. Old people often retain fine mental powers and to a great extent their physical health far beyond the average. This again depends upon differences in individuals. Some of these differences may be beyond their control, but some certainly are within their control. Perhaps the greatest service that may be rendered by these older people is in their advice and example to the younger generation. It is true that times change,

but nevertheless these old folk have lived a life and have learned much during that lifetime. It is well for us to listen and to be guided by their superior experience and wisdom.

## PRACTICAL APPLICATIONS

### For Effective Study:

1. In your own words, explain:

- (a) infancy
- (b) childhood
- (c) adolescence
- (d) maturity
- (e) old age
- (f) senility

What are the chief characteristics of each period, and the rough limits in years?

- 2. What causes the physical and mental changes that occur during adolescence?
- 3. Discuss the "worthy use of leisure time." What would it involve for the high school boy or girl?

### For Observation or Investigation:

- 1. What were Shakespeare's "Seven Ages of Man?"
- 2. Indicate briefly some of the changes in attitudes and ideals that occur during adolescence.
- 3. What are some of the factors in the formation of good character?
- 4. What precautions should one take during adolescence to conserve one's physical and mental future?
- 5. What are some of the factors necessary to a happy family life?

**For Health Habit Formation:**

1. Surround yourself with a good environment:
  - Good companions
  - Good books
  - Good music
  - Good plays
2. Observe the rules of hygienic living:
  - Fresh air and sunshine
  - Exercise
  - Rest and sleep
  - Wholesome food
  - Proper elimination
  - Bathe frequently
  - Avoid alcohol and tobacco
3. Conserve. Spend wisely your
  - Physical strength
  - Mental talents

## XI. HYGIENE AND WORK

### Going to Work:

At about the fourteenth year many boys and girls arrive at an age when they begin to consider seriously their life work. Years ago such a decision rested almost entirely with boys, but of recent years, particularly since the World War, this has applied also to girls. Girls and women are entering industrial and business work in great numbers.

One should consider the whole subject very seriously before giving up school entirely in order to go to work. Many students have no choice. Unfortunate conditions often require good students to leave school before they should. In such an event, an ambitious boy or girl will seek to continue his education while at work or after hours. Some states require workers under a certain age (average 16) to attend school for part of a day each week. Such schools are sometimes called "continuation" schools, for they enable boys and girls who work to continue their education. Evening schools, private and public, also offer opportunity for progress. Many schools, institutes, colleges, or universities offer special courses in the evenings, or even by mail or correspondence, whereby one's education can be extended or continued.

If you are not succeeding well in your studies,

examine the situation carefully. Work may not be the cure. Perhaps there is something that you can correct. Frequently the causes of failure in school are also the causes of failure at work. It is possible that a change to a different type of school work will help. Perhaps there is some physical defect—vision, hearing, or teeth—that can be corrected. A little more will power or regular hours and sufficient sleep may help. Business men often complain of the lack of preparedness of boys and girls, or of their lack of training in matters of self-control. So going off to work may not be the cure for your troubles. The trouble may be within yourself.

Remember that, as a general proposition, the younger the worker is, the lower the starting wages will be and the less desirable the type of position that he can obtain. The longer you stay in school, the better chance you have of getting a good position when you go to work, if you use your time well while in school. By a "good position" is meant opportunity for advancement as much as (or more than) the amount of pay in the beginning.

### Reference Books:

The following books contain valuable information that may aid you in the choice of a career. It is suggested that you read some of them. Your public or school library may have copies on hand, or may have copies of other books of similar value.



<i>Author</i>	<i>Title</i>	<i>Publisher and Date</i>
1. Bernay .....	Outline of Careers	Doran, 1927
2. Cooley, Rodgers & Belman .....	My Life Work	McGraw-Hill, 1930
3. Davis .....	Guidance for Youth	Ginn & Co., 1928
4. Filene .....	Careers for Women	Houghton Mifflin, 1920
5. Giles .....	Vocational Civics	Macmillan, 1922
6. Hill .....	Vocational Civics	Ginn & Co., 1928
7. Holbrook & MacGregor .....	Our World of Work	Allyn & Bacon, 1929
8. Kildruff .....	How to Choose and Get a Better Job	Harpers, 1921
9. Kitson .....	How to Find the Right Vocation	Harper & Bros., 1929
10. Lyon .....	Making a Living	Macmillan, 1926
11. Myers, Little & Robinson .....	Planning Your Future	McGraw-Hill, 1930
12. Platt & Tarnham .....	Book of Opportunities	Putnam, 1927
13. Proctor .....	Vocations	Houghton Mifflin Co., 1928
14. Rosengarten .....	Choosing Your Life Work	McGraw-Hill, 1924
15. Smith & Blough .....	Planning a Career	American Book Co., 1929
16. Teeter .....	A Syllabus on Voca- tional Guidance	Macmillan, 1928
17. Weaver .....	Profitable Vocations for Girls	Laidlaw Bros., 1926
18. Whitehead .....	Your Job	Gregg, 1930

## Child Labor Laws:

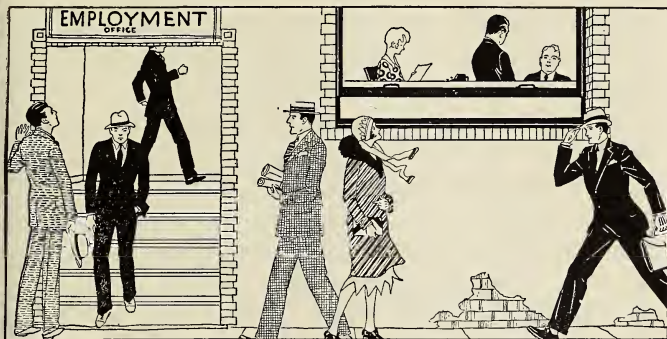
Many states do not permit very young children to go to work. It is not wise to permit a child to go to work or to be sent to work too soon. Such practices tend to cut short the mental and the physical development to which a child is entitled. These

laws are to protect children, and to try to give them a chance to grow up into healthy and happy human beings.

In many states also, the boy or girl who is going to work must pass a certain grade of work in school before obtaining his or her working certificate. In some cases there is a physical examination, and the one who wishes to go to work must first have his physical defects corrected as far as possible, perhaps get glasses or have his teeth filled. There are laws in many places that forbid children to work at dangerous or undesirable positions or for too long a time each day. Other laws may specify that they may work only between certain hours. Night work is generally forbidden. All of these laws, while they may seem to work hardship in some cases, are for the best interests of our children. The state tries to protect its future citizens.

### Physical Fitness:

If you are leaving school to go to work, you should be in good physical condition. A weak child cannot stand the long hours that are ordinarily required in business or industry. If you have a weakness or a defect, it should be corrected before you start to work. If you need glasses, get them; if you have bad teeth, get them attended to. Such defects uncorrected will only interfere with your work, cause illness or poor work that may be un-



### THE FIRST JOB

*Sometimes it is necessary to take what one can get. That should be temporary only. Seek for the position for which you are suited, physically and mentally.*

satisfactory to your employer, and so interfere with any prospects that you may have for advancement.

If you are subject to illness, you should seek your physician's advice as to the type of position that you may be physically fit to take. Certain types of work, particularly confining indoor work or work where there is poor ventilation or little activity, should be avoided. They are especially undesirable for any one who is not strong and healthy.

### Cleanliness of the Worker:

In many positions, in offices especially, a neat and clean appearance is necessary. One should

bathe frequently, see that the hair is neatly combed or arranged, and the nails clean. "Appearance *does* count!" Particular care should be taken to avoid infection through the handling of articles that may have been exposed to contagious diseases, or articles or objects that have been handled by many people (money, for instance). In such cases the hands should be washed carefully before meals, and between washings they should be kept away from the mouth and away from articles that touch the mouth. Small cuts or abrasions of the skin should be sterilized and protected from infection by protective bandages or other coverings.

The wash-up at the end of the day is particularly important for those who may work in industry or the trades. The grime and sweat of the day's work should be thoroughly removed. In many cases work clothes or overalls may be worn during the day. These should be removed at the end of the day and street clothes put on. Many industrial concerns provide sanitary washrooms and lockers for their employees so that they may wash and change at the end of the day. You may not have a "white collar" job, but there is no excuse for remaining dirty or soiled after the day's work is over. Never lose pride in your personal appearance.

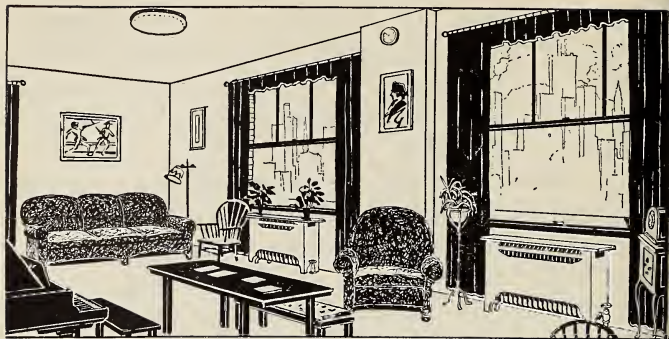
### **Clothing of the Worker:**

Clothing should be suitable to the nature of the

work to be done. In an office or a sales position, clothing should be impressive by its neatness rather than by its extreme style. In such a position, dress is generally accepted as a reflection of one's personality or character. Overdressing is objectionable in either sex, and is just as liable to censure and disapproval as too little regard for personal appearance. In many situations women (and sometimes men) wear a neat smock or long coat of light material to protect their street dress or suit from accidental soiling. This can be laid aside at the end of the day. It too should be kept neat and clean, and for this purpose an "extra" is very convenient.

In factory, mill, or shop it is generally advisable to change outer clothing. Such work clothing should allow freedom of movement, and yet should not be so loose that it may catch in machinery, cogs or belts, and be the possible cause of a serious accident. Workers exposed to the weather should dress accordingly, using boots and waterproof clothing for rainy weather, and heavy clothing and shoes for severe winter weather. Where there is exposure to the hot sun or to the high temperatures of furnace rooms, clothing should be light, and wherever possible, protective devices, such as sunshades, sun helmets, sun glasses, goggles, etc., should be used. It will always pay to be careful in work as well as in play.





### EMPLOYEES' REST ROOM

*Many firms provide splendid rest rooms for the use of their employees. The noon hour offers a fine opportunity for such relaxation.*

### Working Conditions:

The worker has a right to clean and hygienic conditions about him. Such items as light, ventilation, drinking water, lunch rooms, rest rooms, and safeguards on machinery should be properly attended to by the management. If you work in a place where proper attention is not given to these, you should try to have the wrong conditions corrected. Speak to the foreman or the manager. If you cannot secure correction, look for another job. Do not continue in an unsafe environment any longer than you can help. By staying in such a place, you run the risk of illness or injury, and you may do yourself much harm.



Do not be tempted by high wages. It is better to work for lower wages under good conditions than higher wages under poor conditions. Do not sell your health for a few dollars. Many large companies or organizations provide the very best of working conditions for their employees. They do everything possible for the health, comfort, and even the amusement and the education of their employees. Sometimes employees remark, "My company doesn't pay high wages but they do take very good care of their help and it is a pleasure to work there." Working for such companies even at lower wages is preferable to working for higher wages at the risk of sacrificing one's health.

**Light:**

An office or workroom should be well lighted. Modern buildings provide plenty of window space. In addition there should be shades for regulating the light, because the glare of strong sunlight (from a southern exposure, particularly) will cause eyestrain and headaches. It is well to avoid facing the light when working. The light should come from the side, preferably the left. When or where the natural light is not sufficient, small portable lights or desk lamps are valuable because they can be placed so easily in the correct position.

In mills or industrial plants, the use of white paint on the inside walls helps to save light. The

windows should be kept clean. If the building is not modern and does not have sufficient window space to provide enough natural light, there should be a good supply of electric or gas lights. For special conditions, such as looking into the flames of a furnace or a torch, special glasses or goggles should be used. Eyes should be protected from a glare of any kind. If you are subject to headaches, "tired" eyes, or nervousness, observe the kind of light under which you work. Perhaps your working conditions are causing eyestrain. If the light conditions seem satisfactory and your trouble continues, then have your eyes examined.

### **Fresh Air and Ventilation:**

If working indoors, we must consider the kind of air we live in, for we live in the air just as fish live in the water. If the water in an aquarium is permitted to become too warm or too cold or impure, it has an immediate effect upon the fish. In just the same way the temperature of the air about us, its purity or impurity, and its movement have noticeable effects on us.

In offices there is a great tendency to overheat. One must be very careful if one's work is close to a radiator or a warm air outlet. In like manner one should also avoid a direct draught from an open window since the temptation is to raise the window when the office or workroom is too hot. Some move-

ment of the air is desirable, however. Notice how refreshing a breeze is on a sultry day in summer. The best temperature is about 68° to 70° F.

In shops and mills special ventilating systems are often necessary. Operations that create undue heat, dust, or gas fumes should have hoods and pipes provided to carry away the impurities. It is an excellent idea to air the workroom, if possible, during the noon hour. Workers feel better, work better, and avoid illness when they work in fresh air at a normal temperature.

### **Drinking Water:**

Plenty of good wholesome water should be available in every workshop or office. Care should be taken, however, to avoid drinking too great quantities of ice-cold water, especially in warm weather, in furnace rooms, etc. Drink only water that comes from a good source. Do not drink raw or unfiltered canal or river water; it may contain germs. One of the greatest dangers both in office and workrooms comes from the use of a common drinking cup. Disease germs may thus pass from the mouth of one person to the mouth of another. In many places paper drinking cups are supplied. Use a new one each time, unless it is one that you yourself have previously used. It is a good thing to keep your individual cup in your own desk or locker.

“Bubblers” or drinking fountains that throw a jet of water upward toward the lips are sanitary if you make sure that your lips do not touch any part of the metal or porcelain. Be sure that the bubbler or drinking fountain is in good working order before using it. If drinking fountains are not supplied and you have no cup of your own, wash off a faucet (spigot) and put your lips under, making sure that your mouth does not touch the metal.

### **The Lunch Period:**

Wash the hands, always, before eating. If your employers provide a lunch room, use it, even if you carry your own lunch. It is a good thing to get away from your work, your desk, or your machine during the lunch period. The lunch room is more attractive and cheerful, and a more sanitary place in which to eat your food.

You should have something hot, a hot drink or a plate of soup, with your lunch. It stimulates digestion. Be sure to eat a sensible lunch. An office or clerical worker who does not do much physical work should not eat so heavy a lunch as one who does heavy physical work. Balance your meals, do not eat only a dessert. A salad including some lettuce, fruit, or vegetables is excellent for office workers.

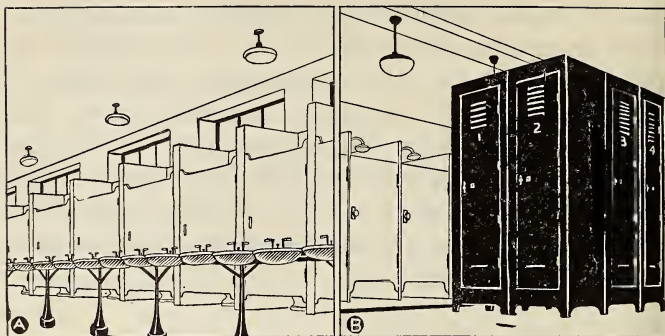
One of the most valuable aspects of the lunch

period is the opportunity it affords to relax mentally as well as physically. It is a rest period. Do not use it up in wild or senseless rough play or excessive physical exercise. Get acquainted with your fellow workers. Be sociable and try to forget the responsibilities of your task for the time being. You will do better work for having had a brief "vacation" during the middle of the day, provided you use it properly.

### **Rest Rooms and Toilets:**

The rest rooms and toilets should be clean. See to it that they are kept clean. Report unsanitary conditions to the foreman or manager. An unclean toilet is one means of transmitting disease. There should be one bowl for every twenty-five people. It should be well lighted, well ventilated, and scrubbed every day by the cleaners. There should be enough strength to the flush of water to keep the bowl clean. If it gets out of order, report it immediately.

Rest rooms or locker rooms should be provided with enough washstands for every one to wash up in comfort and without waiting too long, at lunch time and at the end of the day. Some states require one wash bowl for every thirty employees. Where the work is very dirty or where poisonous substances are handled, there should be hot water, soap, and hand or nail brushes supplied. If paper



### FOR COMFORT AND HEALTH

- A. *Washroom facilities in a modern industrial plant*
- B. *Lockers and shower baths*

towels are not supplied, use one of your own. Do not use a common towel. Such a practice spreads disease. In some industries shower baths are provided, especially where the workers get very hot or very dirty.

### Unhealthful and Dangerous Conditions:

It should be realized that any condition which causes ill health or sickness among the workers is poor business policy on the part of the employer. There was a time, not many years ago, when the employer did not consider the health of his workers as any of his concern. The modern and up-to-date employer realizes that it reduces his expenses and really pays from the business point of view to take



every possible precaution to save the health of his employees. It is only fair to state, however, that many employers have a real interest in their employees' welfare entirely aside from the purely business point of view. The successful employer today is sympathetic and generous in his relations with his workers. As a brother human being, he is happy in planning for their welfare.

It is important for every boy or girl who expects to go to work to know something of the dangers that may confront them in different lines of work. The nature of these dangers will be explained briefly, together with suggestions that will indicate how these dangers may be avoided or reduced.

### **Night Work:**

There are several reasons why night work should be avoided even though it may pay well. It is not wise to sacrifice your health merely to make more money. In the long run the extra money that may be made by night work will probably be paid out in doctor bills.

There are several kinds of night work. One is a regular shift where the worker does no work in the daytime and works only at night. The other is "overtime" where the worker works all day and then does some extra hours in the evening.

"Overtime" generally pays well as far as wages are concerned, sometimes fifty per cent more than

just regular time. One cannot keep this up too long, however, for it will wear down one's reserve strength and health. It should be regarded merely as emergency or temporary work to be given up as soon as possible. Stick to regular hours and the regular working day.

Working on a regular night shift is not healthful because it is disturbing to the regularity of our habits and of bodily functions. Meals for instance are eaten at different times. This is particularly harmful if one works one week in the daytime and the next week at night and so on, in alternation. The night worker must sleep in the daytime, and the daytime is not so good as night for sleeping. The darkness, the quiet, and (especially in summer) the coolness of the night air are factors which make for more refreshing and undisturbed sleep at night. During the daytime there are noises of all kinds, in the house and outside. Sleep is a habit, and if its regularity is disturbed, one is liable to lose the ability to sleep well and to arise feeling refreshed. This sometimes causes a condition known as insomnia, or inability to sleep. Another serious objection to night work is that the worker at night will probably miss getting the same share of the sunlight as the day worker. Sunlight is, of course, very important to health and resistance to disease. Night workers should try to get their share during their off-hours, although the

best of the sunshine comes generally at midday when the night worker may be asleep.

### **Work and Fatigue:**

Fatigue may be due to any one of a number of causes. Some people tire more quickly than others at the same work. Some people work with greater intensity and concentration than others and tire more quickly. Others work at a slower rate and can endure longer. Some kinds of work are more tiring than others. Certain positions call for much mental strain with little physical activity, while other positions require physical strength and endurance with little mental strain.

One's personal condition has a great deal to do with the powers of endurance. The worker who does not eat sufficient food or food of the right kind, or the worker who does not take the proper care of his health in other ways, will tire more quickly than the worker who takes proper care of himself. Long hours of work cause fatigue, as does work requiring great intensity or effort. Monotony, doing the same thing hour after hour, causes mental fatigue. Work that permits of very little physical activity or which requires a cramped or unnatural position is not only unhealthful and dangerous but also very tiring.

Fatigue is a danger signal. Nature wants a rest. To ignore the signal brings trouble. Many

accidents are the result of fatigue. "Asleep at the switch" has become a well-known expression. Under continued strain and fatigue, the health breaks down and bodily resistance to disease is lowered. Nervous disorders or breakdowns are the result of too prolonged mental strain. Illness and disease follow the path of physical exhaustion.

If you cannot stand the strain of your work, whether it be physical or mental, examine carefully your habits of living. Be sure you are getting enough rest and sleep, or play and recreation. Positions of great difficulty or responsibility require plenty of rest and recreation. Avoid worry. Be cheerful at your work. Practice good posture. Observe the rules of good hygiene. Make corrections in your mode of living when necessary. If this does not bring the relief, try shorter hours or a different type of position, even if it is necessary to accept less pay.

### **Occupational Poisoning:**

In many industries and trades the workers must handle poisonous substances or breathe into their lungs gases and fumes which are poisonous. It is important therefore to observe at all times the rules which experience has shown are necessary for the protection of the worker in such trades. Some of the sources in the trades where there is danger of poisoning are:

*Lead:* Smelting, refining, handling lead type, making of white lead, wire, wire cloth, glazing on pottery and enameled ware, storage batteries, plumbing, and painting. A recent investigation showed 77 different industries and occupations in which there is danger of lead poisoning. In some departments 40% of the men have been found to be suffering from some form of this illness.

*Mercury:* Manufacture of felt hats, thermometers, mirrors, ammunition; brass foundries.

*Benzene, Naphtha:* Used in cleaning establishments.

*Wood Alcohol:* In various industries.

*Acids:* Hydrochloric, sulphuric, nitric, picric, and other "corrosive" acids used in many trades and industries (manufacture of jewelry, ammunition, etc.)

*Arsenic:* Used in green paints or pigments, wall papers, cretonne, artificial flowers, smelting, brass finishing, preserving furs.

*Brass and Bronze Dust:* Present in the foundries of this industry.

*Carbon Monoxide Gas:* Steel industry, garages and automobile repair shops (exhaust from gasoline engines and motors).

*Coal Gas:* In gas works, blast furnaces, coke ovens, etc.

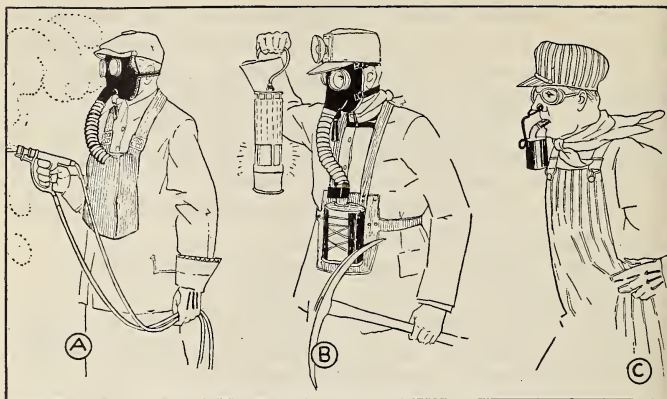
*Dyes:* Fumes from chemicals and dyestuffs.

*Ammonia:* Vapors.

*Skins and Hides* (infectious rather than poisonous): Anthrax, a dangerous disease, is generally contracted from imported rather than domestic hides or skins.

Remedial measures for the above dangers vary somewhat with the type of danger. Gloves can be used to protect the hands; respirators (simple gas masks) to protect the lungs; and goggles or glasses





### LUNG PROTECTION

- A. *For painters (spray) where ventilation is poor*
- B. *For miners*
- C. *For locomotive engineers, in long tunnels*

to protect the eyes. A good management will provide proper ventilation and special systems for drawing off dangerous fumes or gases from the workshop. Washing the hands before eating, keeping the hands away from the eyes and mouth, and changing the clothes (including a cap to protect the hair) are necessary precautions in some cases. Immediate attention should be given to cuts and abrasions and they should be protected against contact with poisonous substances.

Lead poisoning is one of the most common poisonings. Lead is widely used in industry. It can



gain an entrance to the body in the air that is breathed, or through the digestive tract, or by absorption through the skin. Great danger to health exists where small quantities are taken into the body regularly over long periods of time. In such cases the lead is slowly absorbed, and chronic poisoning results; this leads to illness, and often, death.

The danger is especially great in the manufacture of electric storage batteries. In all occupations where there is danger of lead poisoning, good ventilation is extremely important. Dangerous lead-containing fumes should be carried away before the workers have an opportunity to breathe them. The workers should be especially careful in matters of personal cleanliness. Clothes should be changed, hands washed, and finger nails cleaned before eating, so that lead will not be introduced into the body.

Mercury, arsenic, and phosphorus are substances that may cause poisonous effects in persons who handle them. Phosphorus is used in making the kind of match that can be struck anywhere. Safety matches that can be struck only on the box do not contain phosphorus and are harmless. There are two kinds of phosphorus that are used in matches—a harmful and a harmless kind. It is important for the workers to know which kind is being used in the factory. Proper ventilation to carry off the



### POISONOUS FUMES

*This worker is wearing a mask or respirator as protection against the fumes of red oxide of lead. Note the open window, also.*

poisonous fumes, and habits of personal cleanliness are safeguards for those who work with such poisonous materials.

Carbon monoxide gas is an occupational danger in some forms of work. It is especially dangerous around blast furnaces, coke ovens, and in garages. The danger of this gas is increased by the fact that it has no odor and, therefore, no danger signal. It is easily absorbed by the haemoglobin of the red corpuscles in the blood and prevents the body from getting a normal supply of oxygen. Symptoms of carbon monoxide poisoning are dizziness, headache, throbbing of the temples, and ringing in the ears. Paralysis of the lower limbs prevents the victim from getting to the fresh outside air, and loss of consciousness and death often result.

Many states have passed laws for the protection of the health of workers in industry, and further provide for inspection of places of employment to see that the proper safety measures are used. In many places provision is made for the payment or compensation of the worker for illness caused by his daily work. Such laws lead to an improvement in industry. The National Safety Council and insurance companies, with the coöperation of owners, have done much to improve conditions in industrial establishments and to eliminate causes of illness and accident.

New discoveries, inventions, and patent processes are continually bringing into use previously unknown substances, the effect of which on the human system may be dangerous or may not be clearly understood. The use of the spray gun in painting, new chemicals used as solvents, tetraethyl lead in gasoline, and radium compounds in painting luminous figures on the dials of watches and clocks are examples of this. In dealing with new substances be cautious. Do not take chances. Keep them out of contact with the mouth, lungs, and blood stream by following the precautions already outlined on page 326. Frequent investigations are made by private and public agencies of the possible effects of new substances and processes on the health of the worker, and their results or findings are published from time to time. These investigations



### PROTECTION AGAINST DUST

*Explain the advantages or the disadvantages of each form of protection shown above.*

should be met in a spirit of fairness and coöperation, and their final recommendations should be followed by both management and workers.

### Nonpoisonous Dusts:

Dust is a dangerous hazard in many occupations. Harmful changes in lung tissue and high rates for pneumonia and tuberculosis are often found among workers in certain dusty occupations. The dusts from metal grinding and polishing, and marble and granite cutting and polishing are especially harmful to lung tissue. Mining is usually a very dusty occupation. In the textile industries, there is danger from the organic dusts that consist of particles of the cotton and woolen fibers that are handled.



### ARTIFICIAL VENTILATION

*The large hood helps to carry off heat and fumes in this modern laundry.*

The breathing of any kind of dust is undesirable. While some dusts (like powdered lead) are poisonous, there are others that cause even more harm, even though they are not poisonous. Such dusts are composed of minute particles of very hard or sharp (cutting) substances. These hard, sharp dusts are from metals and minerals and are caused by grinding, cutting, polishing, carving, sifting, or handling. They are breathed into the lungs, where they damage the delicate tissue and make the worker very susceptible to attacks of tuberculosis and other lung diseases.

Tuberculosis is the greatest industrial disease. It is caused by a germ which lodges in the lungs. If the lungs are in good condition, the chances are



that the germ will be thrown off with no further harm. But if the lungs are already in poor condition, there is grave danger of the development of the disease. The germ of tuberculosis is spread from person to person through spitting, common drinking cups, contact of the germ with the lips, and in many other ways. Good hygienic practices will do much to avoid it.

Dust may be avoided sometimes by "wet processes," sometimes by enclosing the process in a drum or cylinder which keeps the dust out of the air, or by special hoods or apparatus to draw off the dust as it is created. Ventilation, either by special systems or ordinary window raising, will help. In other cases where it is not possible to confine the dust or draw it off, the worker should wear a respirator or mask to purify the air. Several layers of cloth over the mouth and nose can be used where a respirator or mask is not available. They may be cumbersome or inconvenient, but they should be worn. To neglect this is dangerous.

The common sources of nonpoisonous dust are:

1. Stone and granite cutting, sand blasting.
2. Button manufacturing (bone dust, mother-of-pearl, etc.)
3. Mines, collieries, etc. (coal dust).
4. Dust from grinding, polishing, and cutting minerals and glass.
5. Dust from the manufacture of brooms.

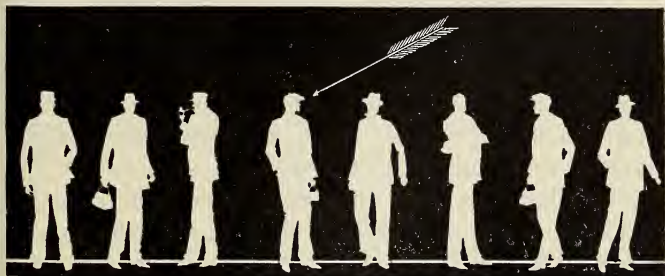


6. Dust from textile and woodworking industries.

### Safety First:

Almost every occupation is dangerous. Even keeping house is not without its dangers, particularly if one is careless. In industry where there is so much machinery and so many moving things, accidents are hard to prevent. There are dangers in an office (lack of sunlight, fresh air, and physical activity, improper lighting, excessive temperature, etc.) no less than the shop. In the shop, however, the danger is more obvious and more immediate.

### ARE YOU THE MAN?



One man in every eight (working full time) will be injured during the coming year.

**WATCH YOUR STEP  
BE CAREFUL**



### EYE PROTECTION

*The arrow points to a glass shield or plate which protects the eyes of the worker from flying particles from the grinding wheel. Goggles are often used for the same purpose.*

Responsibility for the safety of the worker lies with the employer and the employee alike. It is for the employer to see that moving parts of machinery, wheels, cogs, belts, and shaftings are properly guarded by screens or rails, and that other safety devices are supplied. He is also responsible for seeing that the shop is well lighted and orderly. It is for the worker to see to it that these safety devices are used at all times. Where there is danger to the eyes from flying bits of metal or fumes of acid, goggles or glasses should be worn. Protective devices should not be removed or put to one side while a machine is in operation. Do not take a chance. Be sure. Be safe.

**To All Our Employes:—**

**WHO AM I?**

I am more powerful than the combined armies of the world.

I have destroyed more men than all the wars of the nations.

I am more deadly than bullets, and I have wrecked more homes than the mightiest of siege guns.

I steal, in the United States alone, over \$300,000,000 each year.

I spare no one, and I find my victims among the rich and poor alike, the young and old, the strong and weak. Widows and orphans know me.

I loom up to such proportions that I cast my shadow over every field of labor, from the turning of the grindstone to the moving of every railroad train.

I massacre thousands upon thousands of wage earners a year.

I lurk in unseen places and do most of my work silently. You are warned against me but you heed not.

I am relentless.

I am everywhere—in the house, on the streets, in the factory, at the railroad crossings, and on the sea.

I bring sickness, degradation and death, and yet few seek to avoid me.

I destroy, crush or maim; I give nothing but take all.

I am your worst enemy.

**I AM CARELESSNESS**

*(Courtesy of Illinois Steel Company)*

There are many little things that often cause accidents. Carelessness is generally the reason. Something is left out of place, and somebody trips over it. A ladder is not securely set, perhaps, and falls with the worker. Another fails to look where he is going and runs into something, or something

runs into him. All of these things are the responsibility of the worker except to this extent, that the employer should get rid of a careless worker. It is dangerous for others to have a stupid, ignorant, or careless fellow worker about.

### Some Suggestions:

1. Do not wear loose, torn, or flowing clothing about moving machinery.

2. Rubber heels save falls on slippery floors.

3. Always be careful and cautious, not too hasty or too sure.

4. Wear goggles at all times when they should be worn.

5. Do not "step over" danger. Put it out of the way, if you can.

6. On a new job, be sure you understand what you are to do. Work carefully, especially on the first day.

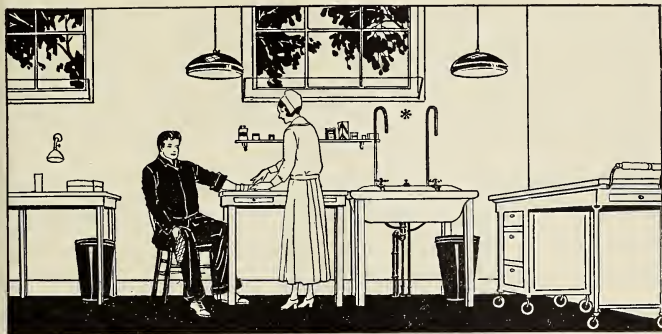
7. Do not skylark, or show off, by doing dangerous things, particularly in the shop.

8. Give prompt "first aid" to small cuts. Protect them from infection.

9. Do not use broken or defective tools or machines.

10. Obey orders, for your own safety and for the safety of others.

11. Use work gloves of canvas or leather to pro-



### DISPENSARY FOR EMPLOYEES

*Large industrial concerns provide medical attention in the form of doctors, nurses, and dispensaries or infirmaries for the comfort and treatment of their employees. Cases of accidental injury thus receive immediate attention.*

protect the hands from rough work (scratches, splinters, small cuts, etc.

12. Avoid over-fatigue, or exhaustion.

### Medical Examinations and Service:

Do not hesitate to report to the doctor or the nurse at your plant if you have had an accident or an injury. This is particularly important if you are working with poisonous substances. Many large concerns have a complete staff and an infirmary for the use of their employees. It is a practice for some firms to examine all candidates for positions before hiring them. This is an excellent custom, for

very often it prevents putting a man in a job that would be very harmful for one in his present physical condition. Such examinations often bring out weaknesses that given prompt attention prevent the development of serious illness.

If there are unsanitary and unhygienic conditions in your shop, you should report them. Change your job if they are not corrected. If you cannot change your job immediately, protect yourself as much as possible by hygienic living at home and at work. Do as much as you can to keep things sanitary. Avoid occupations which expose the worker's health without protection.

Watch your physical condition carefully. Be sure that your work is not affecting your health unfavorably. Have a thorough physical examination once a year. Do not work at a job that may aggravate any particular physical weakness that you may have. A person with weak lungs should not work indoors, but rather at something which, while permitting out-of-door activity, does not expose him to severe weather conditions. Change your job if necessary, in order to get one which will enable you to make the most of your physical condition and disposition.

### Noise:

One of the characteristics of most large industrial establishments is noise. Indeed it seems to be one



of the inseparable conditions of modern life, particularly in large cities or industrial towns. Trolley cars, automobiles, auto trucks, traffic signals, whistles, cries and calls from street vendors, "subways," elevated trains, railroad engines, gasoline engines for many purposes, air compressors and drills, steam shovels, riveting machines, fire engines, police patrols, back-firing autos, and the roar and crash of machinery are some of the sources of noise today that did not exist a century ago.

Many scientists are of the opinion that this endless stream of sound beating against the eardrums is decidedly detrimental to health. If you have ever been in a large factory or mill in operation, you can understand why this may be true. The constant din not only seems to dull the hearing, but also is hard on the nervous system, draining us of our nervous energy. Too much noise is also distracting to the attention and interferes with keen perception by the other senses; thus it causes mistakes and accidents and, by confusion of one's thoughts, interferes with good judgment. Excess noise is irritating to the nervous system and frequently results in loss of temper. Thus noise is regarded as one of the social causes of ill health.

Our first reaction to loud or unexpected noise is that of fear. An extreme instance is the bodily reaction that takes place when we hear the crash of a nearby bolt of lightning. A momentary paralysis



### NOISE!

- A. *Modern transportation*
- B. *Drilling concrete*
- C. *Whistles*
- D. *Riveting*

seems to seize us. Minor noises affect us similarly but in a modified degree, depending upon the volume or the intensity of the noise and the amount of the surprise element present. By such means the muscles of the digestive tract may be affected, and the blood pressure increased. The pulse will beat more rapidly, and the normal secretion of the gastric juices is interrupted. This results in a disturbance of the processes of digestion and assimilation. Such are some of the conclusions reached by scientific investigations of the possible ill effects of noise.

In many occupations today the work is carried on under so much noise that the workers are gradually losing their hearing. You will note frequently in the newspapers that after a long flight in an airplane, the pilot has temporarily lost his hearing because of the long-continued roar of the motors to which his hearing was subjected. Noises by day and night interfere with chances of the sick for recovery by interrupting their rest. Hospitals and homes where some one is sick are subjected to continual annoyance of this kind if located in a city. Even the rest of the well person, child or adult, is broken by early morning deliveries of milk and bread, or by the blowing of auto horns late at night. Sounds are registered in the brain even when we do not awake from sleep. Many people who work in the city have changed their residence to the

suburbs, where conditions are more conducive to rest and quiet. But even those who live in rural or suburban districts are subject to disturbance, if they reside close to main roads where there is much traffic.

What can be done about the matter? Investigations can be made and regulations formed to meet the needs of the community. In the large cities, notably New York, trained minds have been directed toward the solution of this problem. The seriousness of the possible mental and physical ill effects of too much noise is now receiving intelligent attention in many places throughout the United States.

### **Recreation and Rest:**

The problem of getting proper recreation and rest is a very important part of your daily program. What you do with your time after hours, either school or work, has a decided influence on your work. Those who persistently keep late hours at night, get insufficient sleep, and use too much energy in their social life will not have sufficient strength to do their work well the next day. Consequently, the quality and probably the amount of the work that they do will suffer, and they will be less valuable in their positions. In addition, the extra drain on their strength will in the long run affect their health.

Recreation should not be too violent nor too exciting, but it should be engrossing enough to enable one to forget work for the time being. There are some well-known sayings that fit the case well:

"There is a time and a place for all things."

"All work and no play makes Jack a dull boy."

"When you work, work; when you play, play."


The great factor in recreation and rest is *change*. It is the element of change that enables one to go back to work with fresh vigor and strength. For one who uses great physical activity in his daily work, rest is a good change. Rest may consist in this case of lying down, or sitting quietly, reading, or listening to the radio. For one who is not physically active in his daily work, a good change would be physical recreation or games of some kind, not too violent of course. One who uses his eyes a great deal in close work, should perhaps seek his recreation in some form of activity in something that does not involve too great use of the eyes or eye strain. Above all, if your work involves worry or mental strain, try to forget it during off hours. Professional men frequently find pleasure and relaxation in working with tools. Such a recreation would be a very poor one for a mechanic. Those who work in the city go to the seashore and the country for a change, while those who work in the country find relaxation in a visit to the city.





No. H. S. 60

## THIS ENGINE



is inspected regularly by an expert and kept in good condition so it will not break down. Isn't your body worth more to you than this locomotive is worth to the railroad company?


To keep yourself in good health you should be examined once a year by a good doctor if you are healthy, and oftener if you are not in the best physical condition.

*Don't wait until your engine breaks down. Head off disease before it gets a start. It's cheaper in the long run.*

National Safety Council

No. H. S. 116

## Once a Year



A CAREFUL examination by a physician is like giving a machine a good overhauling. You may have some ailment that is just starting and not know it. The doctor will find out and tell you what to do. If you wait until you feel sick, it may be too late.

**It costs less to keep well than to get well.**

National Safety Council

Courtesy National Safety Council

### PERIODIC INSPECTION

*Posters issued by the National Safety Council to assist members in encouraging employees to be physically examined periodically. This work should be done by the health department of the plant whenever possible.*

A "hobby" or a favorite activity into which we put our special interests or special abilities is valuable for all workers. It should be wholesome and healthful. It should not be too exciting or too absorbing, to such an extent, for instance, that we do not take time to eat properly, or to such an extent that people avoid us because we can think and talk of nothing else but our hobby. A hobby should be along the lines of our special interests, music, art, collections, reading, etc. It should contribute



something valuable to our development, physical or mental. Hobbies generally develop without much effort or conscious thought.

Yearly vacations should be healthful and restful. One should not come back exhausted from too great exertion or improper living. Here again the great factor should be a wholesome and sensible change from work.

Sleep is an important form of rest. One should get enough sleep so that he can go to work in the morning feeling refreshed and vigorous. If you get up in the morning feeling tired, you may not be getting sufficient sleep. It is natural to be tired after the day's work. If you are quite tired, sometimes a short rest before eating the evening meal will be refreshing and enable you to eat with more cheerful spirit and greater enjoyment.

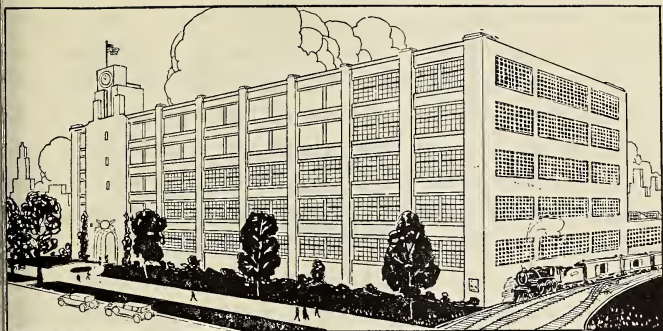
### **Labor Laws:**

We have already noted on page 309, that laws have been passed by some of the states for the protection of children from going to work at too early an age, and for their protection when at work. Similar laws have been passed in many states, also, for the protection of women. Since many women are the mothers of children or some day will be, and because they are not so strong in many ways as men, it has been thought that the best interests of society demand their protection. Accordingly in

many states, laws have been passed regulating the hours and the kinds of labor that women may do. Special provision is sometimes made limiting the number of hours that they may work per day or per week, especially at night. In other cases the length of their noon period must be at least one hour and may not be made shorter. By such means, the health of our future citizens is conserved.

Other laws passed by many states pertain to the health aspect of the worker's life. In order to prevent overcrowding, there must be not more than one worker for every so many feet of floor space, and all places where workers are employed must be well lighted, well heated, and properly ventilated. There must be certain prescribed facilities for drinking water, for washing purposes, and for toilets.

Laws have also been requiring in the dangerous trades the use of certain safety equipment, such as screens, guards, hoods, special ventilating equipment to carry off gases and fumes, etc. For reasons of public safety, railroad employees and others in responsible positions are not permitted to work more than a certain number of periods a day. This is to prevent mistakes caused by fatigue which might result in the loss of many lives. Other laws provide for safety against fire, proper construction of factories, adequate fire escapes, and fire drills. For the enforcement of all these regulations, spe-



### THE MODERN PLANT

*What are the advantages of such a place viewed from the standpoint of health?*

*What hygienic conditions would one have reason to expect inside?*

cial inspectors of all kinds are provided for industrial establishments.

There is a form of labor that is much more difficult to reach by law. This is factory work (like sewing) which is done by many parents in their homes at night. Where parents are ignorant or do not care, many cruel things are done for the sake of money. It is a common sight in certain quarters of large cities to see the whole family sewing until late at night. Little children of six, eight, and ten years of age are required to do their share of this work. Thus, in the very homes where children should be given loving care, they are sometimes being literally worked to death by their own par-

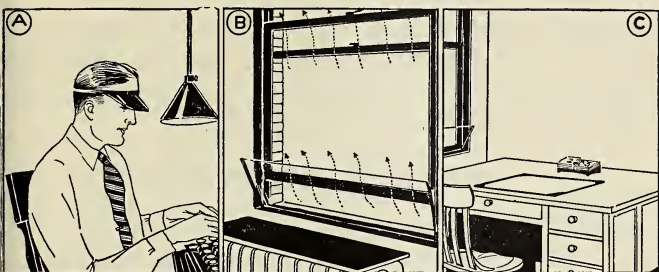
ents. Generally, such things occur only in the homes of the foreign-born, where the people are desperately poor and do not yet understand the part they are expected to play in the care of their children. It is hard to pass laws regulating such conditions because it has long been an Anglo-Saxon tradition (on which traditions many of our American laws and customs are founded) that "a man's house is his castle," meaning that he cannot be interfered with within his own home except under extraordinary conditions. It is this spirit that makes it difficult to pass laws regulating the employment of children in the home.

Certain dangerous forms of employment are absolutely prohibited to women and children in some states. They concern principally the positions in which there is considerable danger of accident and types of work that are considered unhealthful or too much beyond their strength.

Other laws, known as Workingmen's Compensation Laws provide for the payment of wages or damages to workers who are injured or disabled by an accident during the course of their work. Some states also make this provision apply to illness acquired at work. (See Occupational Poisoning, pages 324-330.)

### **Coöperation:**

Both employers and employees must work to-



### IN THE OFFICE

- A. *Avoid glare, or strong direct light*
- B. *Have good ventilation, but avoid drafts*
- C. *Always keep your desk in an orderly condition, inside and out*

gether for the elimination of dangerous conditions. The use of alcohol has always been a contributing cause of accidents. Men who are under the influence of strong drink are a danger to others and themselves as well. Smoking is also dangerous. A half-burnt match, a cigarette stump, or live sparks may start a fire that will cost many lives and throw hundreds out of work, with resulting hardship and loss to their families. Many employers prefer men who do not smoke or drink. Spitting is another great danger in a shop. Sputum (spit) often contains disease germs (tuberculosis, for instance) which rise in the air and are breathed in by others. Spitting is a filthy and dangerous practice. In many places it is against the law. Do



not do it yourself and try to prevent others from doing it. Wherever conditions can be improved around the shop, a suggestion in a pleasant way will often help to make things right.

### PRACTICAL APPLICATIONS

#### For Effective Study:

1. Name some of the modern safeguards, facilities, or other equipment that a worker has a right to expect in an up-to-date office or industrial plant.
2. State some good rules to observe during the lunch period.
3. What are the disadvantages of night work?
4. Name some types of occupational poisoning.
5. Be prepared to tell what means are used to counteract the dangers of each of them.
6. Name the different types of dust that are considered harmful to the health of the workers. How may each be counteracted?
7. State some good general rules for "safety-first for the worker."

#### For Observation or Investigation:

1. Does your state have a Child Labor Law or a Compulsory Education Act? What are its provisions? Whom is it intended to benefit? Discuss its advantages and its disadvantages.
2. Why does a state have the authority to control the education or the working hours of its children?
3. Which is better, higher wages and poor working conditions or lower wages and good working conditions? Support your opinion with arguments.



4. What is the duty of the worker, where unhealthful or dangerous practices exist?
5. What is the relation of your physical condition to your work? How can you safeguard your health?
6. Name some of the important aspects of recreation and rest in relation to one's work.
7. Name some of the types of labor laws. For what purpose are they passed? Does your state have any? Name a few.

### For Health Habit Formation:

1. Remember, appearance does count.
  - Clean hands
  - Clean face
  - Clean clothing
2. Select a type of position that is agreeable to your physical condition.
3. Where possible, change work clothes for street clothes.
4. Do not work under continuously unhealthful conditions.
5. Protect your eyes.
6. Breathe fresh air.
7. Drink pure water.
8. Eat a wholesome lunch.
9. Avoid night work where possible.
10. Do not overwork.
11. Invest your leisure time wisely.
12. Use safeguards wherever possible.
13. Observe the rules for "Safety-First" that apply to your particular job.
14. Coöperate.

## **XII. CARE OF THE BABY**

### **Importance of Proper Care:**

About 250,000 babies die each year in the United States. About 100,000 die during the first month of their lives. Many of these deaths could be avoided by proper care. In many other cases there is illness which could have been prevented. Sickness in a baby weakens it and may leave it sickly for a long time. Many such children are "spoiled" during attacks of illness because sickness interferes with the habits of regularity and of good training that are so essential to happiness in later life.

The whole trend of the child's future life may be unfavorably affected by some attack of illness which could have been avoided, or by poor management due to lack of knowledge. Many pupils who have younger brothers or sisters in their care during a part of the day, may be able to contribute knowledge or help that will result in the life of a child being healthier and happier. We owe the baby a square deal, and as good a start in life as it is possible to give him.

### **Normal Development:**

It is very fascinating to watch for the signs of development in a baby. All babies do not progress at the same rate, some lag a little, some a great deal. This is not always a thing to worry about,



### GAINING?

*The baby should be weighed regularly. There should be a steady, even though slight increase in weight. If the baby ceases to gain, or starts to lose weight, the advice of a physician should be sought. Keep a chart or written record showing dates and weights.*

But it is something to watch carefully. Here are some of the signs to watch for in the development of a baby:

#### (a) GENERAL DEVELOPMENT

##### Age

##### Signs of Development

- |                            |   |
|----------------------------|---|
| Three or four days—        | Begins to hear things and to notice light.                            |
| Two months—                | Tries to lift head and to put hand to mouth.                          |
| Three or four months—      | Tries to sit up, grasp things, expresses pleasure or displeasure.     |
| Six months—                | Makes sounds, imitates, can sit alone a little.                       |
| Seven, eight, nine months— | Creeps, tries to stand, imitates movements and sounds, tries to talk. |
| Nine to twelve months—     | Learns to stand.  |
| Twelve to sixteen months—  | Learns to walk, begins to talk, tries to please people.               |

#### (b) GROWTH IN WEIGHT

The weight of the baby is one of the most important things to watch. Failure to gain the regu-

lar increase (approximately) may be serious, and the advice of a physician should be sought. Allowance should be made for the fact that not all babies are of the same weight when born, but there should be a steady increase. The baby should be weighed at least once a week as a check on his health and development.

TABLE I—AVERAGE WEIGHTS

Age	Average Weight	Note: These weights are "Average." A little more or a little less is not serious, provided there is continued increase in weight each week.
1st Week—	7 lbs.	
2nd Week—	7 lbs. 6 oz.	Do not fail to consult a physician if the baby fails to gain. Serious illness may be avoided by prompt treatment. Loss of weight is a danger signal.
3rd Week—	7 lbs. 14 oz.	
4th Week—	8 lbs. 6 oz.	
5th Week—	8 lbs. 8 to 14 oz.	
6th Week—	9 lbs. 0 to 6 oz.	
7th Week—	9 lbs. 8 to 14 oz.	
8th Week—	9 lbs. 14 to 16 oz.	
9th Week—	10 lbs. 0 to 8 oz.	
10th Week—	10 lbs. 6 to 14 oz.	
11th Week—	10 lbs. 10 oz. to 11 lbs. 4 oz.	
12th Week—	11 lbs. 0 oz. to 12 lbs.	
Six Months—	about 14 lbs.	
One Year—	about 21 lbs.	

TABLE II—WHEN TO WEIGH

Age	How Frequently	Always weigh on the same day of the week, at about the same time of day.
First nine months—	every week	
Ninth to Twelfth month	—every two weeks	
Second to Sixth years	—every month	

## Food and Drink:

The best food for a baby is that supplied naturally by its mother. This is called breast feeding or nursing. The importance of this over bottled milk is shown by the fact that only six per cent of the breast-fed babies die during the first year of their life compared to twenty-five per cent of the bottle-fed babies.

Except under unusual conditions, this nursing should continue *at least* until the baby is six months old, and in most cases until the ninth month. After the seventh or eighth month the baby may be given some cow's milk from a bottle, and this should be gradually increased so that at the end of a year the baby is no longer nursed by the mother. This process of transferring from the mother to the bottle is called "weaning." Weaning should be avoided during the hot months of summer, and as it is a serious step in the life of the baby, it is wise to consult the doctor before doing so.

The first cow's milk given to the baby should be only half-strength, and should be gradually increased to full strength (10th or 11th month). About this time, small quantities of milk should be given in a cup so that the baby may learn gradually to drink from a cup.

There are three things to remember about milk—

1. It should come from healthy cows.
2. It should be kept clean.

3. It should be kept cool at all times.

A separate ice-box or compartment is desirable for baby's milk if it is possible to secure one.

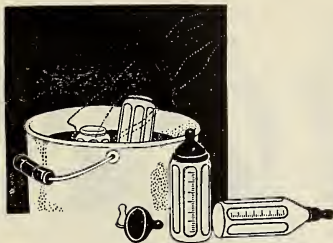
The best cow's milk to use is "certified" milk. This is guaranteed to meet certain requirements of purity and of food value.

The next best is Grade A (best quality) of pasteurized milk. Milk may be pasteurized by heating it to 145° Fahrenheit, keeping it at that temperature for thirty minutes, then chilling it suddenly and keeping it below 50° Fahrenheit until used. This process kills disease germs. In many cities the large milk supply companies pasteurize the milk. If your supply of milk is not pasteurized you can make it so by following the directions given above. All raw milk, except certified milk, should be pasteurized. But even pasteurized milk is not safe unless it has been given the proper care (kept cool and clean) after it has been pasteurized. All such milk should be used within twenty-four hours of its pasteurization.

Scalded milk will destroy *most* disease germs. If there is any doubt about the cleanliness of your milk supply, be sure to scald the milk. Milk may be scalded by heating it in an open vessel until it bubbles around the edges and steams in the center. This is not the same as boiling, however.

Boiled milk should be allowed to boil for three minutes.





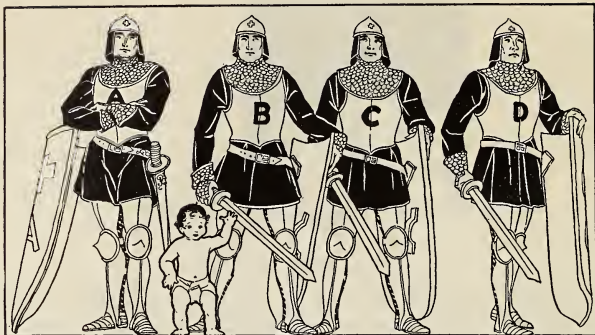
### BABY'S BOTTLE

*A number should be kept on hand for a reserve in case of accident. Bottles should be sterilized in hot water, although ordinary glass will sometimes crack. Special bottles may be bought which will not crack in hot water.*

Evaporated or condensed milk does not properly meet the food requirements of a baby, no matter how it is used. Therefore, it should be used with fresh milk or for a short time only in an emergency.

Dried milk or milk powder may be used when fresh milk is not available, but some vegetable or fresh fruit juice should also be given each day. Be sure that the can which contains the milk powder is kept tightly closed.

So-called "Infant Foods" as advertised are often incomplete foods and need milk to go with them. Generally they are quite sweet and usually contain more sugar than is good for the baby. A baby may be "fat" but not healthy otherwise. Use such "foods" only when recommended by a physician.



### BABY'S FOUR GUARDS

*Vitamins protect the baby:*

- A. protects against infections, colds. Guards normal growth.*
- B<sub>1</sub>, B<sub>2</sub>. guard against loss of appetite and growth; nervous disorders.*
- C. protects against scurvy and similar disorders.*
- D. guards against rickets; poor bone formation.*

Nursing bottles should be first rinsed, then boiled. Several should be kept on hand. Non-collapsible nipples should be used. They should be cleaned after each feeding, scrubbed inside and out, and boiled. A supply on hand ready to use will be a convenience. In order that they may be free from germs, they should be kept in a small jar of boric acid until needed for use.

Drinking water for baby should be boiled each day, then cooled, but it should not be given to the

baby too cold. A few drops at a time should be given during the first few days and then gradually increased until he is taking five and six ounces a day, between feedings. Remember, baby cannot say when he is thirsty, and he is most likely to be thirsty on a warm day.

Fresh orange juice should be given after the first month, beginning with a teaspoonful a day and increasing from one to three teaspoonfuls when a year old. Strained tomato juice may be used as a substitute for orange juice when that is not available. It should be given just before the second nursing. Later it may be given twice a day—in the morning and late afternoon, just before nursing.

Cod-liver oil, "bottled sunlight," should be given just before the orange juice. Holding the baby's mouth open by pressing his cheeks gently will prevent him from spitting it out. It may be omitted on very warm days, and a sun bath given instead. At the age of one month, give half a teaspoonful twice a day.

### **Other Foods:**

Barley water or oatmeal water instead of plain water may be used to dilute the milk after the sixth month. Cereal gruel may be used after the seventh month. After the eighth month, beef juice or beef tea and a piece of zwieback or dry bread

## VITAMIN SUMMARY FOR BABY

		VITAMINS			
		A	B	C	D
Milk	=	A	B	C	D
Eggs	=	A*	B <sup>*1</sup> <sub>2</sub>		
Orange Juice	=	A	B <sup>1</sup> <sub>2</sub>	C*	
Tomato Juice	=	A	B <sup>1</sup> <sub>2</sub>	C*	
Spinach	=	A*	B	C	
Potatoes	=	A	B	C	
Cod Liver Oil	=	A*			D*
Sunshine	=				D†

\* = Rich supply.

† = Varies with season of year, amount of exposure, etc.

may be given the baby after nursing. After the ninth month, crackers and broth may be added.

Additional valuable information in detail can be secured by writing to the Children's Bureau of the United States Department of Labor for Bureau Publication No. 8 on "Infant Care," or to the United States Public Health Service, Treasury Department for "The Care of Your Baby." Single copies of these very valuable pamphlets are furnished free on application. Standard works on the Care of the Baby will also furnish much additional valuable information. They can be purchased at bookstores or from publishing houses. Your doctor can recommend such a book.

### **Clothing:**

The skin of a baby is very tender and easily irritated. Consequently the clothing of a baby should be very soft. Starched clothing should be avoided. The clothing of a baby should be changed frequently. Soiled clothing if kept on too long will cause sores or inflammation. Before putting on fresh clothing, it should be warmed by holding it against the cheek for a few moments. Clothing should be taken off and put on over the feet rather than over the head in order to avoid discomfort to the baby. It is better to have the baby clothed lightly rather than too warmly, adding a jacket or wrap for the cool of the morning or of the evening.



### COMFORT

*The baby's clothes are comfortable at all times. Pins, buttons, folds, or wrinkles must be carefully watched to see that they do not hurt. Soiled clothing should be removed immediately.*

Occasionally, during the middle of warm days or when changing his clothes, if the room is warm, it is a fine thing to let the baby play around on the bed for a few minutes. He should be watched carefully to make sure that he does not fall off. As the baby grows older, careful attention should be given to seeing that his shoes are comfortable, and not tight.

### Sleep:

Bassinet or basinette is the name used most frequently for baby's bed. It originally referred to a basket which was used as a cradle. If one does not



have a modern baby bed or bassinet, a clothes basket makes a good bed for the first few months. It should be placed securely on a chair or a box, never on the floor. The rocking motion of the old-fashioned cradle is now considered objectionable. A feather pillow should not be used as a mattress but rather a mattress of hair, felt, or cotton covered by a rubber sheeting or oil cloth. On this should be placed soft washable pads, covered by a sheet.

Sleeping bags that button up are sometimes used for babies. They prevent the cover from being kicked or pushed off. Pillows should not be used. A clean napkin folded properly should be used for a pillow.

Babies should sleep alone. In this way they are safer, healthier, more comfortable, and less subject to disturbance. They should do most of their sleeping at night, although daytime naps should be taken until a child is six years old. Bodies grow mostly during sleep, and it can therefore be easily seen why sufficient sleep is essential to proper growth and development.

Baby should sleep approximately (including the daytime nap):

1st four weeks—18 to 20 hours daily.

5th week to end of 1st year—16 hours daily.

One to two years—12 hours daily.

This may vary somewhat according to the health

of the child. Frequently a baby is cross because it has not had sufficient sleep. Careful mothers usually put their babies to bed about six o'clock and awake them for nursing around ten or twelve o'clock. Then the babies generally sleep until six in the morning when they should be nursed again. Starting the baby right in his habits of sleep is very important, and a healthy baby is easily trained. It is beneficial for both baby and mother.

In pleasant weather, the daytime nap may be taken out of doors. Care should be taken to shield the baby's face and eyes from the sun, and he should be screened safely from insects. The room in which he sleeps indoors should be well ventilated.

### **Bathing:**

The baby should be bathed at least once a day. Extra sponge baths may be given during warm weather. The bath should be given in the morning before the mid-morning nursing, but not until an hour, at least, after the previous meal or nursing. Mid-morning is desirable since by that time the sun is up and the rooms are well warmed. There is then not so much danger of the baby's catching cold. The temperature of the bathroom should be about 75°, not much warmer nor much cooler.

The temperature of the water should at first be 98° or 100°, but this may be reduced gradually to about 96° for a six-months-old baby and even 80°



### BABY'S BATH

*The baby should be carefully supported during his bath to prevent injury. This is especially necessary if the large (adult's) tub is used. Do not leave him alone in the tub.*

for a baby one year old. Do not test the temperature until the baby is undressed and ready to go into the water. It is better to use a wooden floating thermometer than the hand as it is more reliable. It will frighten or injure the baby if the bath is too warm or too cold. Never add hot water while the baby is in the tub, and never leave a young baby alone while he is in the tub. Do not leave the tub on the stove while bathing the baby! The baby should be carefully supported during his bath to avoid scaring him and to prevent injury. A good quality of Castile soap for the baby's bath is recommended. Toys which float can sometimes be used to make the bath more enjoyable and interesting.

When drying the baby after the bath, care should

be taken to use soft towels and to avoid rubbing the skin with them. They should be used more like a blotter. After the baby is thoroughly dry, talcum powder may be used to prevent inflammation and chafing, especially around the creases and folds in the skin. Baby should be dressed quickly, and in a room that is not too cool. Be sure that the fresh clothing is slightly warm before putting it on.

### **Handling:**

A baby should never be lifted by the arms. He should be grasped by the body or the shoulders. Care should be taken to support the head with the palm of one hand and to support the spine and neck with the corresponding arm. Careful support should be given to a young baby during the bath.

Babies should not be taken up and handled immediately after meals. Bouncing a baby may cause muscles to become stiff or bruised. Occasionally, a young baby should be turned over from back to stomach, or stomach to back, in order to ease his muscles, as they may get tired from being in the same position for too long a time. Be sure to protect the baby's eyes from a strong light. Do not encourage him to try to lift his head until after the fourth month, nor to sit up until after the sixth month. He should not be assisted to walk too soon—let him take his own time. His legs must be given time to grow strong enough to support his weight.



### SUNLIGHT FOR HEALTH

*Natural sunlight is best. In winter cod liver oil and sun lamps may be used for substitutes. It is wise to consult a physician about the use of a sun lamp.*

### Fresh Air and Sunshine:

Baby should have as much fresh air as possible day and night. He should take his daytime nap outdoors in the sunshine when the weather permits, taking care, however, to see that his eyes are shielded from any glare or sunlight shining into his eyes. In cold weather he will need a sleeping cap indoors as well as out.

In warm weather, sun baths, either when nude or in a sun-suit, are excellent. One should be careful, however, to accustom the skin gradually to the sunlight. Begin with only a few minutes and then gradually lengthen the time of the sun bath. Ordinary window glass keeps out the valuable

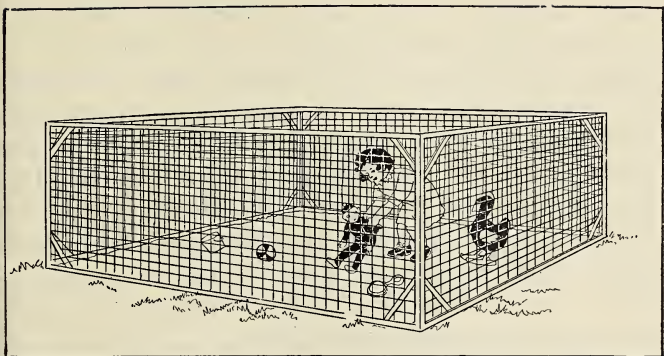
ultra-violet rays of the sun; so direct exposure is better than exposure to the sunlight with glass between. Sunlight lamps may be beneficial (much of their value being in direct proportion to their cost), but under certain conditions bad effects might be experienced. Sun lamps should be used only after consultation with a physician. Clothing also keeps out valuable rays; so for a sun bath, the less clothing the baby wears the better it is for him.

It may sound strange that cod-liver oil is sometimes called "bottled sunlight." The story is interesting. The oil comes from the liver of the cod, and the valuable element in the oil comes from a little green plant eaten by the codfish. The little green plant derives its medical value originally from the sun itself. So the good that we extract from taking cod-liver oil is closely akin to the good derived from sunlight itself. In addition, the oil has a very beneficial effect on the alimentary canal. Cod-liver oil, therefore, while not exactly preferable in taste to candy, is very valuable, especially in the winter time.

### **Play:**

A young baby should be permitted to kick and play freely for a few minutes after his clothes have been removed for the bath and also just before putting on his night clothes when getting him ready





### A PLAY PEN

*Enables baby to play out of doors in either sunlight or shade and keeps him from danger. They can be bought or made at home. A blanket should cover the floor.*

*Playthings should be soft, clean, and unbreakable. Be sure the colors do not run. Soft rubber is better than wood.*

for bed in the evening. Such play should be very gentle, not rough nor too exciting. Teasing of course may have a bad influence on the mental development of the child and should be avoided. Play just before bedtime is a good opportunity for father and baby to become acquainted.

As the baby grows older, toys should be given to him to play with in his crib or play-pen. Such toys should be washable and soft. They should have no sharp edges, and should be too large to go into his mouth. A few good toys are better than a

large variety. As new toys are added to his collection, old ones should be taken away. He should be encouraged to take care of his toys. Where possible, let the baby find out for himself how to get back things which he has dropped. Do not teach a baby how to stand or walk. Let him try for himself. Playpens are valuable indoors or out. They assist a baby in learning to walk and also keep him out of mischief. Give the baby as much liberty as possible—have very few “don’ts.” Be clear and firm, but pleasant, and always mean what you say. Fresh air and sunshine are valuable aids at playtime. It is important, too, that the baby learn to play by himself in the beginning; as he grows older, playmates should be permitted gradually, not too many at a time.

### Keeping Well:

“Prevention is better than cure.” There are certain precautions that should be observed in order to protect the baby from illness:

1. Keep the baby away from adults or children who have colds or other illnesses.
2. Do not permit strangers to kiss the baby. If baby must be kissed, he should be kissed on the cheek rather than the lips. (Most people carry disease germs in their mouths.)
3. Keep the baby away from crowds, gatherings of people, and parties, especially during the winter months.
4. Pay careful attention to the amount of clothing worn by the baby. It should be adapted carefully to all changes in temperature.

## Symptoms of Illness:

A healthy child not only gains a little weight regularly each week, but also sleeps quietly, breathes through his nose, has a warm, moist skin, slightly pink, eliminates from the bowels regularly once or twice a day, and cries only at times—when hungry, uncomfortable, or angry. A child is not necessarily ill just because he cries. Here are some symptoms of illness that are more reliable than the mere crying itself:

1. Contracting of the face muscles and clenching of the fists (caused by pain), when crying.
2. Skin—unusually pale or unusually flushed.
3. Continued refusal to eat.
4. Prolonged crying, low moaning with slight turning of head, or convulsive shrieking.
5. Temperature over  $98.6^{\circ}$  (a good thermometer is invaluable in a home).
6. Vomiting, diarrhea, or constipation.
7. Rash, or inflamed skin.
8. Continued failure to gain in weight; or what is worse, loss of weight.
9. Continued perspiration about the head.
10. Signs of a cold—watery eyes, running nose, cough, etc.

## The Sick Baby:

Any home treatment should be only temporary while awaiting the call of the doctor.

1. Don't guess. Send for the doctor.
2. Have plenty of fresh air.



### *DON'T SPOIL HIM*

*Babies need attention and mothering, but they can be spoiled if taken up every time they cry*

3. Give little to eat, but plenty to drink (water only).
4. Put baby to bed and try to keep him quiet.

### **Crying:**

Very often babies cry because they are uncomfortable. A change of position will often relieve them. Be sure there is no loose pin sticking them, or anything chafing the skin. The need of a change is sometimes the cause of the crying. At other times it is hunger; then the crying is often a low whimper increasing later to a yell accompanied by a sucking of the fingers. Sometimes air in the alimentary canal causes pain. Often this can be relieved by taking the baby up for a few minutes and gently patting its back. Cries from pain or colic are strong cries, often accompanied by clenching of the fists and tears in the eyes. A very sick baby does not usually cry hard. Such crying is

more like a low moan, with continual turning of the head from side to side.

### **Safety-First for Baby:**

1. Keep baby away from the fire, lamp, or stove.
2. Playthings should be
  - a. Washable (with colors that will not "run").
  - b. Too large to be put in the mouth.
  - c. Not pointed or sharp.
  - d. Few in number.
3. Medicine bottles and harmful substances should be kept away from his reach.
4. Play should be in a safe place:
  - a. Not on any place from which he can fall.
  - b. Not on the floor, unless safe from draft and on a clean sheet or blanket.
  - c. Small, spring gates should be placed at the head of stairs and steps.
  - d. Not in a swing or hammock, unless attended by some one, or else, strapped in a chair or swing that will not upset.
  - e. Where he cannot wander away, and where he can be seen from time to time.
  - f. Play pens are ideal.
  - g. In the sunshine (eyes properly guarded).
  - h. In the shade in summer.
5. Keep disease germs away:
  - a. Sterilize (boil) bottles and nipples.
  - b. Do not kiss baby often and only on the cheek.
  - c. Keep baby away from others who may have colds or contagious diseases.
  - d. Avoid crowded places and too many playmates.
6. Do not permit baby to touch strange dogs or cats.

## First Aid:

First aid should not be last aid. It is wise, except in the case of very slight accidents, to send for the doctor. It is suggested that a First Aid Manual of the type issued by the American Red Cross or the Boy Scouts of America should be in every home in a place where it can instantly be located and consulted. It is better to consult such a book with its thorough and careful directions than to depend on memory—particularly at a moment of great mental strain or excitement. Therefore, in case of emergency the procedure should be

1. Send for a doctor or nurse;
2. Consult the First Aid Manual for directions;
3. Try to keep cool.

There are several first aid treatments that apply particularly to a baby. If he is choking on something he has swallowed, try to reach it with the fingers. If this cannot be done hold him up by the legs, head down, and tap firmly (not violently) on the back. If necessary, try again with the fingers.

In case of convulsions send for a doctor. In the meantime place the baby in a warm bath. Be sure it is not too hot, since in the excitement many babies have been seriously burned in this manner. The water should be warm, 98° to 100°. If no thermometer is available, test with your elbow. Keep cold cloth around the head and neck. Continue bath for ten minutes; then put baby to bed





### HABIT FORMATION

*Begins early. Above: (a) Baby should be taught that it is fun to put the blocks back again into the box. (b) Help him to be a "good sport" when he falls by treating the incident without concern or worry yourself.*

until physician arrives. Most attacks of convulsions are caused by improper foods, but sometimes it is more serious than that. Be sure to call the doctor.

### Habit Formation:

During the early days, weeks, and months of this new life that is just beginning its education, habits are tremendously important. Every act will have its good or its bad effect. Bad impulses as well as good have a tendency to repeat themselves. It is important, therefore, that from the beginning the new little being shall form right habits. Organs should be trained to work at certain times; nursing

should be given and meals should be eaten at regular hours; there should be regular periods for sleep and for play. A healthy child is, of course, much easier to train than one that is ill and fretful. This again emphasizes the need of taking all possible care to keep the baby well.

### Mental Hygiene:

Most of the "contrariness" of young babies can be traced to poor training or to poor health. Unless a child is given clearly to understand that *this may* be done and *that may not* be done, with no uncertainty or changing of the mind by the parent, the child can never be certain in his own mind what he may do or may not do. Consequently he will be getting into trouble and will receive many scoldings and punishments through no fault of his own.

A healthy baby seeks to please. He loves to laugh, coo, and be happy. It is unfair to punish a child for what he does not understand. He should be taught, guided, and led to do right things. Emphasis should be on praise for being "good" and doing right things rather than on mere punishment for doing wrong things. "Deliver him from temptation." Keep wrong things out of his path and out of his reach, and it will save much trouble.

It is important that the baby be happy and cheerful. Give him suitable food, plenty of sleep, suitable play, clean clothing, fresh air, regular hours,

firm but kind treatment and the child has a good start toward a happy life. Always keep in mind the value of a good example.

### **Child Management:**

The home is the workshop in which the character of the future person is created. This training of the baby begins with the first months of his life, and impressions made at that time may, and do, affect the entire future life of that individual. It is difficult to condense in a few lines advice which might properly take up an entire book. But there are certain things that we can consider if only briefly:

First, the value of an example. A good example is worth more than words. If the child is to be gentle, parents must be gentle; if the child is to be truthful, parents must be truthful; if the child is to keep his word, the parents must, and so on. There is no use in telling a child one thing, and then acting on an entirely different principle ourselves. Their tendency is to copy what they see.

Second, the treatment of the young child should be fair, gentle, and consistent. Sometimes this is very difficult to do. If we are not consistent, the child is bewildered and does not know what to do. If we are not gentle, he becomes nervous and frightened and loses confidence in us. If we are not fair, we lose his trust and love. Such errors in

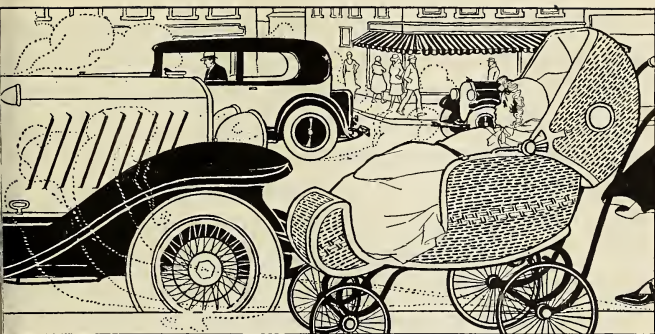
the early training of a child often lead to serious defects in character later in life.

Children should be trained and helped to do difficult things that they need to learn to do in their mental life. Place constant stress on the good results that come from doing "right" things and the pain and trouble that come from "wrong" things. Too great temptation for the child should not be left in his way. It is better to avoid them until he is older and more able to withstand them. Above everything else, be a real friend and wise guide to this beginner on life's pathway.

Much helpful advice on the training of young children can be obtained from the two pamphlets "Infant Care" and "Child Management" mentioned at the end of this chapter. They are very valuable.

### **Daily Program:**

The value of regularity has been discussed under Habit Formation. It is, therefore, important that nursings, bath, play, and naps should take place at a definite time each day. A baby should be given the same systematic and careful attention that any delicate organism or machine deserves. Right habits should be started in the beginning and lived up to by the parents. To break up the regular routine of the baby's day interferes with proper habit formation, and in addition may make him cross and irritable.



### UNDESIRABLE

*The baby is out of doors, but in the wrong spot. What are some of the undesirable features of his environment?*

### SUGGESTED PROGRAM

- 6:00 A.M.—First Nursing
- 9:00 A.M.—Bath
- 9:15 A.M.—Second nursing; then nap until noon
- 2:00 noon—Noon meal or nursing; then out-of-door airing and nap
- 3:00 P.M.—Afternoon nursing; followed by play, ride in baby carriage, etc.
- 6:00 P.M.—Evening meal or nursing  
Sleep until 10:00 or 12:00 P.M.
- 0:00 P.M.—  
or Nursing
- 2:00 P.M.—  
Sleep until 6:00 A.M.

If more convenient, the entire program may be moved back a half-hour or an hour.

Of course such a program needs to be varied somewhat as the baby grows older. The United States Department of Labor, Children's Bureau, has for distribution a series of cards, ready to hang up, so that they can easily be consulted. Each card contains not only a time schedule adapted to the age of the child, but also has on it, both front and back, many valuable suggestions regarding baby's food, play, sleep, clothing, health habits, and bathing. These cards are also adapted to the various stages of the baby's development. This series of "Time Cards" (Chart No. 14) for the baby is as follows:

- (1) C.B. #116 (yellow)—For babies under five months.
- (2) C.B. #117 (blue) —For babies of five and six months.
- (3) C.B. #118 (buff) —For babies of seven, eight, and nine months.
- (4) C.B. #119 (green) —For babies of ten, eleven, and twelve months.
- (5) C.B. #120 (orange)—For babies of one year to eighteen months.
- (6) C.B. #121 (white) —For babies of nineteen months to two years.

A single set (one of each) can be obtained free by applying to the Children's Bureau, United States Department of Labor, Washington, D. C.

### For Reference:

Every home where there is a baby should have



some books or pamphlets that may be consulted from time to time, particularly if there is no doctor within easy reach or call. There is so much information that can be obtained for little or no cost that there is no excuse for being without it.

### *Free Pamphlets:*

Single copies of any of the pamphlets listed below can be obtained by writing for them:

- (1) From the Children's Bureau, United States Department of Labor, Washington, D. C.:  
Folder No. 5—Sunlight for Babies  
Chart No. 14—Baby's Daily Time Cards  
C.B. No. 8—Infant Care  
C.B. No. 30—Child Care (Pre-school Age)  
C.B. No. 143—Child Management
- (2) From the United States Public Health Service, Treasury Department, Washington, D. C.:  
Reprint No. 727—The Care of Your Baby
- (3) From a number of life insurance companies:  
Various pamphlets on the care of the baby.
- (4) From State Departments of Health in many states:  
Various pamphlets on the care of the baby.

### *Magazines:*

- (1) The Parent's Magazine, New York City, contains many articles written by well known authorities on the care of babies and children.
- (2) Hygeia, published by the American Medical Association, Chicago, Illinois, is one of our foremost health magazines and may be accepted as an up-to-date and reliable health authority.
- (3) Other magazines dealing particularly with the interests of women and the home.

*Books:*

There are many books that deal with the care of the baby. It is suggested that your doctor or nurse may be able to recommend one or more if you so desire.\* However, first send for the free pamphlets issued by the government. They probably will contain as much information as you will need, perhaps more.

*First Aid:*

- (1) American Red Cross—Abridged Text Book on First Aid.
- (2) Handbook for Boys, Boy Scouts of America.

**PRACTICAL APPLICATIONS****For Effective Study:**

1. Name some of the signs of an infant's growth and development, and tell approximately when each may be expected.
2. Distinguish between:

(a) Certified milk	(d) Boiled milk
(b) Pasteurized milk	(e) Dried milk
(c) Scalded milk	
3. Give some rules for baby's:

(a) Diet	(d) Handling
(b) Sleep	(e) Exercise
(c) Bath	

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\**The Care and Feeding of Children*, by L. Emmett Holt, M.D. (D. Appleton & Co., New York City), is recommended by many. The *American Red Cross Text-Book on Home Hygiene and Care of the Sick* also contains a valuable chapter on Babies and Their Care.

4. What steps should be taken in the treatment of a baby that has symptoms of being sick?
5. Name some references that may be consulted for reliable information on the Care of the Baby.

#### **For Observation or Investigation:**

1. Is a "fat" baby a sure sign of a healthy baby?
2. What precautions should be taken to guard an infant against contagious diseases?
3. What are some symptoms of sickness in a baby as distinguished from an ordinary crying spell?
4. What can be done for babies in regard to:
  - (a) Habit formation
  - (b) A good disposition.
5. What are some of the methods that should be used in good management of a child?
6. Why is a daily program important?
7. If possible, procure a copy of one of the references suggested.

#### **Health Habits for Baby:**

1. A daily program.
2. Pure milk.
3. Plenty of vitamins.
4. Suitable food.
5. Sleep at regular hours.
6. A clean body.
7. Careful handling.
8. Comfortable clothing.
9. Happy play.
10. Fresh air and sunshine.
11. Safety-first at all times.
12. Protection from contagious diseases.
13. Sympathetic treatment.
14. A good example from which to copy.

### **XIII. CARE OF THE SICK**

#### **Importance:**

When sickness comes, a good nurse is "worth her weight in gold." Some women and girls seem naturally fitted by disposition and ability to be good nurses. They love to take care of some one who is sick. Those of us who have been sick can remember with grateful affection the care and the thoughtfulness bestowed upon us by our mothers and other members of the family during the long dreary hours of the day or night. Such care helps to keep a patient contented, and is often a great influence in his ultimate recovery.

#### **Early Diagnosis:**

One of the most important factors in the quick recovery of a patient is the early recognition of the disease, and the correct treatment that goes with such recognition. In this connection it must be emphasized that much danger attends any attempt by unskilled people to diagnose illness. Get the patient to bed, whether it be adult or child, and keep him there until the doctor arrives. The doctor should be the best available. Beware of quacks or unlicensed physicians. Do not take them because they are cheap. A good doctor is less expensive in the long run. Do not delay sending for

the doctor. What seems to be a bilious attack or a cold may be something more serious. By home dosing, valuable time may be lost. Some degree of the seriousness of the illness may for the moment be obtained by taking the temperature. If the temperature is several or more degrees above or below normal, no time should be lost in sending for a competent physician.

### **The Modern Hospital:**

In many cases the seriousness of the disease is of such a character that the attention it demands can best be given in a hospital. Here the patient will often receive better care than in the home. Hospitals are organized for such cases, homes are not. In the home all sorts of other activities are going on and must go on. This often puts an unusual strain and burden on the person who does the nursing, particularly if she is not a trained nurse.

On the other hand, hospitals have many kinds of equipment and facilities that are not available in homes. They are ready for instant use if needed. Everything is conducted on a high plane of efficiency. The many details that are likely to be burdensome in the home, are handled easily in the hospital.

Many persons have a dread of going to the hospital. If they realized that the care given there gives



### HEALTHFUL AND MODERN

*One of the advantages of modern hospital treatment lies in the superior bedroom equipment and comforts. What advantageous features can you see?*

them a better chance for recovery than in the average home, and, at the same time, spares the other members of the household from strain and risk of infection, they would probably go more willingly. Many lives have been lost by attempting to nurse the patient at home that probably would not have been lost if the patient had been taken to a hospital.

### Nursing at Home:

However, there are times when it is unwise to have the patient removed to a hospital. Often the illness is of such a character that hospital treatment is not required. In other cases there may be no hospital in the immediate neighborhood. A



trained nurse can often be secured either for full time or part time service. Physicians generally know of nurses who have had experience and will recommend them when needed. Some life insurance companies provide certain types of nursing service. Nurses or experienced aids in nursing are invaluable, particularly when there is no one experienced in such matters in the home.

It has been estimated that over 90 per cent of the nursing in cases of illness takes place in the home. When the need for such nursing comes, it is invaluable for some one in the home to know what to do and how to do it. The pages immediately following will contain some brief suggestions regarding the more important things. For more detailed information, there should be in each home a book for reference. An inexpensive volume for this purpose is issued by the American National Red Cross. It is called the *American Red Cross Text-Book on Home Hygiene and Care of the Sick*. It costs less than a dollar and can be obtained by writing to the nearest branch of the American National Red Cross.

### Choosing the Room:

Choose a quiet room with plenty of sunshine and fresh air. Little noises which are scarcely noticed in health often annoy and irritate one when sick. It should be the best room in the house from the

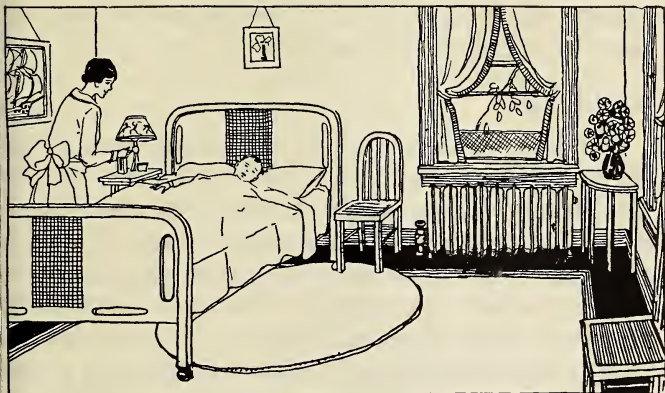
standpoint of ventilation, heat (coolness in summer), and freedom from disturbance.

Remove all unnecessary things which might collect dust and germs and interfere with the entrance of fresh air and sunlight. Curtains may be needed to protect the patient's eyes from any glare. These should be simple and frequently washed. Do not permit articles of clothing to hang about the sick room. Flowers give color and life to a sick room, and their presence is cheering to the patient. Flowers with a heavy or pungent odor should not be used.

### **Keep the Sick Room Clean and Sanitary:**

Germs of disease are spread from the sick to the well. Keep the sick room clean. Soap and hot water are valuable for this purpose. Use great care in disposing of the body wastes from the sick room. They should be promptly removed and destroyed, or treated with powerful disinfectants to kill disease germs in them.

During a quarantine, all persons except those actually caring for the patient should be kept out of the sick room. Those who look after the patient should take care that they do not spread the disease when they leave the sick room. In most cases a disinfecting bath and a change of clothes are recommended for this purpose. Whenever in doubt consult your physician.



### A SICK ROOM

*Choose a Room with Plenty of Sunshine and Fresh Air*

#### **Isolation:**

A sick person should have a bed, and if possible a room, to himself. If the disease be serious or contagious, this is absolutely necessary. In such cases only those attending the sick person should be allowed to enter the sick room. Visitors should not be permitted. In the case of a contagious disease, it is often advisable for the attendant of the patient to have a separate room as well. Where it is possible, separate bathrooms should be used. However, a small house often prevents such arrangements being made. The separation of the patient from the rest of the family in cases of serious illness not only serves to prevent the spread of con-

tagious diseases, but adds to the peace of mind and comfort of the patient as well.

### **Ventilation:**

The sick room should be well ventilated at all times, day and night. Windows should be open at the top as well as at the bottom, but the patient should be protected from a direct draft of air. A standing screen or a sheet used as a screen may be used to shield the patient. The room should be "flushed" with fresh air once or twice a day by raising all the windows. This need last but a few minutes, during which time the patient should be well covered. Electric fans are useful in making the patient more comfortable in warm weather, but here again a direct draft should be avoided.

### **Lighting:**

Sunlight is a powerful disinfectant and it is helpful in other ways as well. It not only kills disease germs, but it gives cheer to the sick room and to the patient. It should be remembered, however, that too much sunlight or glare is tiring to the eyes. Therefore, the light should be carefully regulated, particularly if the patient is lying with his face toward a window; this applies to artificial light as well. A darkened room with a very small light is generally most restful to patients at night. A small bedside lamp, carefully shaded, is desirable

for this purpose. If this is not possible, an electric flash light is helpful for the use of either patient or nurse. Matches are dangerous and should not be permitted in the hands of the sick.

### **Cleaning the Sick Room:**

Dry cleaning, such as dusting or sweeping, is unhealthful and irritating to the patient because it raises too much dust. For dusting, either damp or oily cloths should be used. Vacuum cleaning, with attachments, is preferred for floors and furniture where its use is possible. If a broom or brush is used, it should be dampened or else covered with a damp cloth.

### **The Bed:**

The best bed for a sick person is probably the one to which he has been accustomed. Strange beds and mattresses are often uncomfortable, or at least seem so. Therefore, if possible, give the patient his own bed. If the illness is of such a nature that it is necessary to change beds, be sure that the new bed is a comfortable one. The mattress should be firm, yet not too hard. It should be elastic enough to permit the hips and shoulders to sink in.

The mattress should be turned over occasionally, perhaps once a week, or a new mattress may be substituted for a change. This affords an opportunity of airing or cleaning the used mattress. If



### FRESH BED LINEN

*is essential to the comfort of the patient. It should be changed frequently and "aired" whenever possible. Bed clothing should be kept smooth and free of wrinkles. Frequent changing or shifting of the pillow is refreshing to the patient.*

possible, leave it in the open air exposed to the sunlight for a day. A badly soiled or stained mattress should be sent away to be cleaned, and if necessary, rebuilt. Old quilts or rubber sheeting may be used to protect the mattress.

The springs should be firm. A spring that is too soft allows the patient to sink in too far and makes it difficult for him to change positions. It may be very uncomfortable.

The ordinary white enamel frame is the most suitable type of bed, because it is easy to keep clean. The bed should be of medium height and neither too narrow nor too wide. These factors are impor-



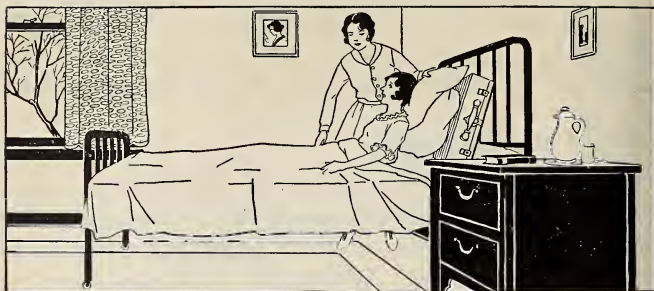
tant for ease in moving the patient. The bed cover should be light in weight for the comfort of the patient and, at the same time, warm and washable.

### Care of the Patient:

Making up of the bed with fresh linen adds much to the comfort of the patient. Changing the pillows, turning them over or changing their position, is also helpful. Whenever it is necessary to change the position of a patient, it is a good thing to explain in advance what you are going to do and how you are going to do it. This prevents the patient from becoming alarmed and also enables him to assist a little in the process. In order to avoid possible injury to the patient, one should not attempt to lift or move him unless one has the strength to do so.

Bedsore often develop on the patient's body unless care is taken to turn him frequently, and the bed linen is kept smooth and free from wrinkles. Bathing helps to prevent sores by keeping the skin in a healthy condition. Soft pads may be used to relieve pressure on "bony" spots where sores are most likely to develop.

If the patient is able, sitting up in bed is a welcome relief. Special back supports can be purchased for this purpose, or may be made at home. A suitcase or the seat and back of an old chair may be used. In all cases the back rest should be



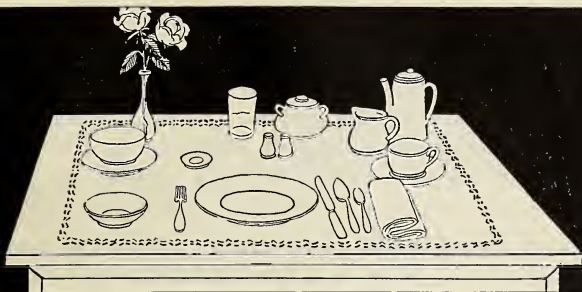
### A BACK REST

*for the patient may be made by using a suitcase as the support, covered by pillows*

padded with pillows. Bed tables can also be purchased or made at home for the use of the patient in eating, reading, or other forms of quiet activity.

Food for the sick is subject to the condition of the patient and the doctor's orders. The tray on which the food is brought to the bedside should be made as tempting and attractive as possible. A flower often helps. If possible the likes and dislikes of the patient should be anticipated and followed, although it may not always be practicable to consult him as to what he would like.

Patients generally require some assistance at mealtime. Helpless patients will require a great deal. When drinking from a glass, the head of such patients should be raised with one of the nurse's hands behind the pillow. With the other



### THE FOOD TRAY

*should be attractive. In the case of a contagious disease, paper napkins and doilies should be used. Afterward they should be burned.*

and she can hold the glass. Straws or bent glass tubes are of great assistance. Children are particularly fond of them. In feeding with a spoon, care should be taken to see that neither the food nor the spoon is too hot. Food should be given in such a manner as not to interfere with the patient's breathing. Above all, the patient should not be hurried.

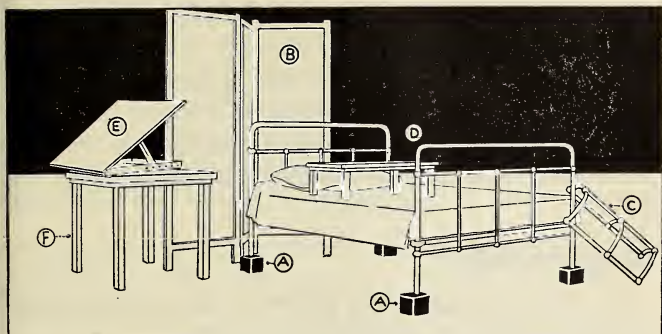
### Bathing the Patient:

Bathing the patient should never be neglected. A bath is not only stimulating in a physical sense but it is very refreshing to the patient as well. There are two kinds of baths for the sick. The first is the cleansing bath. The other is one which

may be a part of the treatment prescribed for the patient. The latter type will not be described here because the physician will generally prescribe how he wants such baths given.

A cleansing bath should be given to the patient each day, subject to the doctor's orders. If the patient is not too ill, a tub bath is generally preferred, giving the patient whatever assistance may be necessary. Be sure that the bathroom and the bath are ready before taking the patient to the bathroom. Sometimes the patient will need help in bathing the back and in using the towel after the bath. The patient should be assisted in getting into and out of the tub. Clean sleeping garments, bathrobe and slippers should be ready for the patient after the bath in order to reduce to a minimum any possibility of chill or catching cold. If the patient seems a little chilled after returning to bed, a hot water bottle, warm covers, and perhaps a hot drink may be provided. There is little danger of chill if the proper precautions are taken. The bath should be brief, lasting not more than ten minutes. This time affords an excellent opportunity for flushing the sick room with fresh air and for airing the bed and bed linen.

If the condition of the patient does not permit the taking of a tub bath, a bath may be given in bed, using a basin and a wash cloth. This is generally called a sponge bath. It may be possible for



### COMFORT FOR THE SICK ROOM

*helps both patient and nurse. Placing the bed on blocks (A) raises the bed. A screen protects from drafts (B). A "bed cradle" (C) keeps the weight of the bed covers from a sensitive foot or leg. (D) A bed table. (E) A back rest. (F) A bedside serving table. Many of these articles can be made at home.*

the patient to assist in washing certain parts of his body during the bed bath. In order to avoid dripping, be sure that the wash cloth is not too wet. Use a smooth even movement, keeping the wash cloth flat in the hand or wrapped around it. Wash the face, neck, and ears first and dry them. Then wash the chest and abdomen, then the back, and the legs and the feet last. Be sure to wash all the places that are hard to reach, such as under the armpits and between the toes. Move the patient as little as possible, and expose only one part of

the body at a time. Clean and trim the toenails. The hair should be combed at least once a day. The use of an alcohol solution and sometimes a little talcum powder are refreshing if applied after the bath. The nurse or attendant should be sure to wash her own hands carefully after bathing the patient.

### **Giving Medicine:**

In giving medicine the following directions should be followed by the attendant or nurse:

1. Give only according to the doctor's orders.
2. Give undivided attention to:
  - a. Selecting the proper bottle (look at label before removing the cork and again when replacing it).
  - b. Measuring proper amounts.
3. Shake the bottle well.
4. Protect the cork and contents of the bottle from contamination.
5. Keep all medicines carefully labelled.  
    Destroy unlabelled boxes and bottles.
6. Where medicines are used in alternation, use a device or system to indicate the next to be used. Be sure to change the indicator each time the medicine is used.
7. In giving liquid medicine be sure to do so in such a way as not to interfere with the patient's breathing. Raise the head by supporting the pillow.

### **Medicine in the Home:**

At this point it is well to remember what has already been said about the use of drugs and the



dangers of self-diagnosis and self-treatment in Chapter VII, Health and Science Today. The emphasis in modern medicine is on the use of natural methods for the treatment of illness. For special emergencies, however, each home should have a medicine cabinet stocked with some standard remedies. The following are suggested:

A Laxative or Cathartic—Castor oil, Epsom salts, Rochelle salts, or Cascara sagrada.

A Stimulant—aromatic spirits of ammonia.

1. May be inhaled (from a cloth)

2. May be taken internally ( $\frac{1}{2}$  teaspoonful to  $\frac{1}{4}$  glass of water).

Disinfectants—Iodine (a poison), or mercurochrome. Poisons should be kept in distinctive bottles with distinctive stoppers. Paint the wound lightly with either of these solutions.

Boric acid (powder)—For the use of eyes or mouth. Mild, one teaspoonful to a pint of water.

Rubbing (denatured) alcohol—50 to 60% solution. May be used for the skin, or for disinfecting thermometers or small instruments used in the sick room.

Salves or Ointments—Tubes are preferred to cups or jars.

Vaseline for burns or blisters.

Boracic ointment or similar preparations.

Poisonous Drugs—Should not be kept on hand. Buy only as required, then dispose of the remainder in a safe manner.

Miscellaneous—Bicarbonate of soda (baking soda) for indigestion. Essence of peppermint may be taken with it for the relief of cramps or gas.

Mustard, to induce vomiting, taken internally,  $\frac{1}{4}$  teaspoonful to one glass of warm water.

Olive oil for external or internal use.

First Aid—A first aid kit containing a collection of materials needed can be purchased at almost any drug store. If possible, keep the kit unopened until needed.

First aid supplies should be kept safe from dust and in the original unbroken package—gauze, bandage, absorbent cotton, and adhesive tape.

#### Miscellaneous Articles—

Blunt scissors

Cotton swabs on toothpicks in a sealed jar

Castile soap

Medicine glass with measurement markings

Teaspoon

Medicine dropper

Drinking glass

\*Hot water bottle

\*Fountain syringe and attachments

\*Electric pad

#### Preventing Contagion:

Bodily discharges and wastes should be immediately disposed of in such a way as to prevent the spread of any contagious disease or illness. Discharges from the nose can be taken on old (but clean) rags, linen, cheesecloth, or on paper napkins. These should be burned immediately or placed temporarily in a closed paper bag until they are burned. Handkerchiefs and bed clothing should be sterilized by boiling. While awaiting sterilization, they should

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\*Should be kept in a drawer accessible to the bathroom.



### THE PULSE

*This illustration shows just where to place your finger or thumb in order to "feel" and count the pulse beat. The places marked "X" show where the pulse may be detected.*

be placed in water in a covered receptacle. Towels, basins, and other appliances should be kept separate from those in use by the rest of the family. Toys and other playthings may be sterilized by boiling.

### Records:

The physician sometimes requires additional information from the attendant or nurse about the condition of the patient at certain times during the day. This information is often a valuable index to the progress of the patient. Inexperienced nurses may find difficulty, however, in accurately recording the necessary information since considerable practice is needed.

The pulse is quite variable according to the individual. It is highest in infancy and lowest in old age. At birth it may run as high as 130 or

over per minute. It drops close to 100 by the end of the first or second year, and for the average adult is about 78. It may run a little lower for men (72) and a trifle higher for women (80). A little variation from normal is not considered especially significant. The pulse should be taken with the forefinger (never with the thumb) from the thumb side, and on the inside, of the patient's wrist.

The normal temperature is 98.6 degrees. Some healthy individuals have a normal temperature of a degree or two less. The temperature may be taken with a medical (clinical) thermometer placed in the mouth or under the tongue. Use great care to read it correctly. The thermometer should be left in position for at least two minutes. After use, it should be washed in cold water. This will help to bring the mercury back into position again, although it is usually necessary to shake the thermometer several times with a sharp snap of the wrist. Washing in warm or hot water often causes the thermometer to break. It should also be washed in alcohol after using.

Normal respiration for the adult is about 16 to 18 per minute. For the infant it may be as high as 30 and for children from 20 to 25. The normal respiration is about one-fourth of the pulse rate.

Information regarding the temperature, pulse, and respiration is kept by nurses on the charts which the doctor may read easily when he calls.

They should be kept away from the patient, thus eliminating a possible source of worry.

### Good Cheer:

Visitors should not be permitted to see the patient if there is any possibility that the visit will worry or disturb him. This is particularly important during a serious illness or during the critical stages of an illness. Visits should ordinarily be brief in order that the patient may not be greatly tired. The attendant or nurse should be one who is pleasant and cheerful. Great patience is required,



### CONVALESCENCE

*Quiet amusement, busy work, games, and reading should be permitted but care must be taken to see that the patient gets plenty of rest and sleep as well.*

particularly in the handling of young children or aged people. The mental attitude of the patient is often a great factor in his recovery.

### Convalescence:

The period of recovery from a disease is called convalescence. The return to normal strength may be rapid or slow, depending upon the nature of the disease and the body resistance of the patient.

The physician's orders during convalescence should be strictly obeyed. During many diseases, the strain upon the heart, kidneys, and other organs of the body is very severe. In such cases, permanent injury to these organs may result if the patient attempts to resume an active life too soon. With young children, the period of convalescence is often a trying one for the patient and the parents. The patient may feel so well that it is difficult to understand why it is still necessary for him to remain in bed. At such times, stories, quiet occupations, and games are indispensable.

### PRACTICAL APPLICATIONS

#### For Effective Study:

1. Why is early diagnosis important?
2. Name some of the factors in the choice of a room for the patient at home.
3. How may the sick room be kept clean and sanitary?
4. How should a patient be moved?



5. What measures should be taken to prevent the occurrence of bedsores?
6. For an adult, at rest, what is the normal:
  - a. Pulse?
  - b. Respiration?
  - c. Temperature?
7. What precautions should be observed during the period of convalescence?

### **For Observation or Investigation:**

1. Discuss the differences between modern hospitals and those of past years. How may fear of going to a hospital be overcome?
2. Compare the advantages and the disadvantages of
  - a. Hospital care
  - b. Nursing at home.
3. What measures may be taken in home nursing to prevent the spread of a contagious disease?
4. Explain the importance of a comfortable bed, and name some of the qualities that make it so.
5. How can a food tray be made attractive to a patient?
6. Find out what is meant by:
  - a. A liquid diet.
  - b. A soft diet.
  - c. A light or convalescent diet.
  - d. A full diet.
7. How can bed linen be changed without removing the patient from the bed?

### **For Health Practice:**

1. Keep the sick room:
  - a. Quiet
  - b. Attractive

- c. Clean
  - d. Well lighted (and shaded)
  - e. Properly ventilated
  - f. Sanitary
2. See that the patient:
- a. Is made comfortable.
  - b. Kept cheerful.
  - c. Bathed frequently.
  - d. Fed properly.
  - e. Receives frequent changes of bed linen and apparel.
  - f. Is given medicine promptly and according to directions of the physician.
  - g. Does not overexert or expose himself to a setback during convalescence.

## **XIV. THE PREVENTION OF COMMON COLDS\***

### **Importance:**

Colds take more dollars and cents out of the worker's pocket in one year than any other sickness. They are responsible for a greater loss of time from school and work than any other single cause. They lower resistance to pneumonia. Pneumonia caused more deaths in the United States in 1925 than any other disease except heart disease.

Avoid taking cold. If you do get a cold, take care of yourself so that you will get rid of it quickly.

### **How You Catch Cold:**

There are two kinds of common colds, the cold which you catch from other people, and the cold you take even though no one around you has one. People who have adenoids or diseased tonsils or are run down are likely to have either kind. The germ which causes you to "catch" cold may enter your nose and throat passages from the air when the infected person talks, coughs, or sneezes. You may catch cold by using an unwashed glass, spoon, or

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\*Adapted from material issued to the Philadelphia Public Schools in connection with Public Health Day, March 26, 1930.



### GET RID OF COLDS QUICKLY

*All colds have serious possibilities. They may lead to severe illness, to lowered bodily resistance, or to ear trouble.*

fork which has just been used by some one with a cold. The germs may be on your hands because you have touched something which has been handled by the person with a cold. Washing the hands before eating or before touching the face will help to prevent this.

People who "take" cold by "catching" it from other people are most often those who have poor circulation or some local infection in the nose or throat. Wearing too little or too much clothing so that the body is either chilled or overheated, predisposes one to a cold. If the skin is kept clean and healthy by frequent warm baths, followed by a cold plunge or shower, or a dash of cold water, and a vigorous rubbing, the body can better stand quick changes of temperature.

## **How to Take Care of a Cold:**

When your head stops up, your back and legs ache, your eyes burn, there is a tickling or soreness in the throat, and you have other signs of a cold, such as sneezing or a running nose, you should start "first aid" right away. Very few colds would develop into serious illnesses if the person who has the cold were wise enough to take proper care of himself at once.

Rest in bed, if possible, or at least indoors, particularly if you feel weak, as weakness is a sign of influenza. Take a laxative. Drink plenty of cold water and eat lightly of simple, nourishing food. If you have fever and pain, call a doctor.

Always cough or sneeze into a handkerchief (which should be boiled when washed) or a cloth or paper napkin that can be burned, so that you will not give your cold to others. People who have a cold should stay by themselves as much as possible, because what seems to be a cold may be one of the first signs of influenza or pneumonia. Diphtheria, measles, scarlet fever, whooping cough, or smallpox may also start with what seems to be only a cold. Isolation rules should be kept for "just a cold," because it is very contagious and serious sicknesses may follow it.

## **Common Dangers of Common Colds:**

When, besides the general symptoms of a cold,

you have a fever and your back and legs ache badly, you are probably taking the grippe or influenza. You should call a doctor at once. The grippe, or "flu," is dangerous not only because pneumonia often follows, but because of other troubles which may result. Rheumatism, tuberculosis, heart disease, sinus infection, kidney trouble, chronic sore throat, and nasal affections may have their beginning in grippe, or "flu."

Many deaf people can trace their deafness to a cold. If you have an earache or an abscess in the ear, see a doctor. Infection may cause serious trouble.

### **To Keep From Taking Colds:**

(1) Stay away from people with colds. Especially during "flu" epidemics, it is wiser to stay at home than unnecessarily to be part of a crowd in poorly ventilated rooms, amusement places, or meeting places. If some one near you sneezes without taking the proper protective measures, move away or use your own handkerchief as a means of protecting the air you breathe.

(2) Keep up your bodily resistance:

(a) Eat Plenty of nourishing food, including all of the vitamins, but particularly vitamin A. This vitamin is believed to be effective in helping to prevent certain infections, particularly



colds and other diseases of the respiratory tract. Do not overeat. Avoid too many sweets and other "acid-forming foods" (see pages 251-254). Drink at least four glasses of water each day.

- (b) Exercise outdoors in the sunshine every day, if possible.
- (c) Get plenty of sleep—at least eight hours each night. If you are unable to get eight hours every night, "average" eight hours by sleeping more the next night, or take naps if possible.
- (d) Avoid exhaustion or overfatigue, both mental and physical.

(3) Train your skin to stand changes in temperature by frequent bathing. Bathing each morning with water cool enough to give a healthy glow after the rubdown is good for hardening the skin. If cold water is too much of a shock at first, the temperature can be lowered a little each day. Sponging the neck and chest with cold water in the morning and rubbing well with a rough towel are helpful if an entire bath cannot be taken.

(4) Wear sensible clothing. Wear enough clothes to be comfortable. In this day of overheated houses, offices, and shops it is better to put on extra wraps when going outdoors than to wear heavy underwear all the time. Winter shoes should have thick soles and rubbers should be worn on

rainy days. Wool stockings are advisable in winter.

(5) Breathe through your nose. Air is filtered as it passes along the nasal passages on its way to the lungs. The mouth-breather takes germs directly into his throat. See a doctor if you have trouble in breathing through your nose.

(6) Have diseased tonsils, enlarged adenoids, or abscessed teeth removed.

(7) Wash your hands often, always before eating. Brush your teeth at least twice a day.

(8) Live and work in well ventilated rooms. It is better for the thermometer to read 68° than over 70°. Overheated rooms cause more colds than underheated. Windows should be opened at least twice a day, even during the winter, for complete change of air. If there are dust or fumes where you work, wear a mask if possible, at least "sweep out" your lungs with fresh air for a few moments at your lunch hour or when walking part of the way to and from work.

(9) Sleep with open windows in winter and summer. It is not enough that air be cold, it must be fresh.

(10) Keep your feet dry. An extra pair of shoes and hose kept at your place of work will add to your health and comfort when you are caught without rubbers. Rubbing the feet briskly with a rough towel will help you keep from taking cold from wet feet.



### KEEPING UP BODILY RESISTANCE

*This is an important measure in the prevention of colds*

(11) Cool off gradually. If you are perspiring, an electric fan or a cool breeze may start a cold.

(12) See a doctor if you keep on taking cold in spite of taking care of yourself. If you take cold

often or if colds hang on, your health needs watching.

### PRACTICAL APPLICATIONS

#### For Effective Study:

1. How does one "catch cold?"
2. Name and discuss the measures that should be taken to prevent cold infection.

#### For Observation or Investigation:

1. Name some serious effects that may follow a cold.
2. Why is the prevention of colds so important?
3. How may bodily resistance to colds be maintained at a high level?
4. Name some "base-forming" foods. Of what value are they in helping to prevent infection by a cold?
5. Name some of the chief sources of vitamin A. What is its value in relation to infection by a cold?
6. Can you think of a better way of expressing "catching a cold"?

#### For Cold Prevention:

1. Avoid possible infection.
2. Keep up bodily resistance.
3. Train your skin.
4. Dress sensibly.
5. Breathe through the nose.
6. Have physical defects corrected.
7. Wash hands frequently.
8. Breathe fresh air—night and day.
9. Avoid drafts.
10. Keep your feet dry.
11. Change wet clothing.
12. Avoid too much acid-forming food.
13. Get plenty of vitamin A.
14. Consult a physician for chronic colds.

## PART THREE

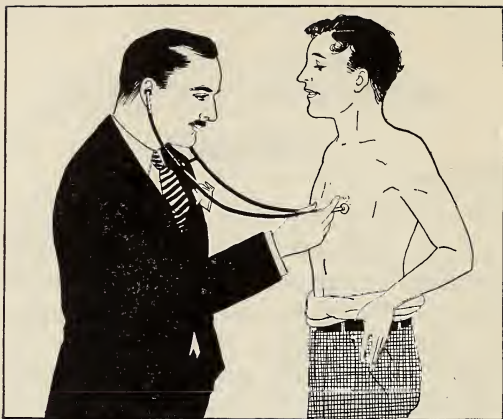
# PERSONAL HYGIENE

### A REVIEW

#### Introduction:

The automobile has been used to illustrate different parts and activities of the human body. There is also a close relationship between the quality of "*service*" and the care and treatment that is given to these two types of "machines." The machine that is cared for properly lasts longer and performs more faithfully than one that is neglected or abused. The "good" automobile is dependable. It serves us in our daily tasks and recreations without needing constant repairs and adjustments. When in use we are not conscious of its separate parts; all work together quietly and smoothly. Such results are obtained from habitual attention to fuel and lubrication needs and occasional attention to natural wear and tear on moving parts.

The human "machine" also gives better service when it is properly cared for. In health, one is not conscious of the body. All parts work so harmoniously that the attention can be given to other important, constructive, helpful tasks and problems of the daily life. It is only when some disturbing defect appears that one becomes conscious of the separate parts and hastens to correct the fault.



### THE PHYSICAL EXAMINATION

*Whether given in school, at work, or by a private physician, is an excellent means of checking up on one's physical condition.*

Health is one of the "commodities" that is not wholly purchasable with money. It is true that money will buy pure food, pure water, sanitary disposal of wastes, and some other community health essentials. Personal health, however, is purchasable chiefly by the attention that is given to habits of living. Further protection is secured in the form of increased resistance to the attacks of disease. Habitual attention should be given to health matters connected with personal cleanliness, nutrition, exercise, rest, sleep, and elimination of wastes.



Occasional check-ups on the effectiveness of the growth, development, maintenance, and repair of the human "machine" should be made. A very satisfactory method of doing this is to have a thorough medical and physical examination by a competent physician at regular, stated intervals. "Have a thorough examination every birthday" or at least "once a year" is an idea that is coming more and more to be realized as good "health insurance."

Desirable health habits are built up by following the right "pattern" day after day. For your assistance certain suggestions are included here which, if followed, will make desired habit formation easier, or perhaps, more certain. They are based on the principles formulated by a famous psychologist.

Remember:

1. Understand clearly what is to be done (how, and when, and where).
2. Fix this in your mind by repeating the idea to yourself a number of times.
3. Begin with enthusiasm.
4. Start today.
5. Never miss a chance to practice.
6. Permit no exceptions. Always the same way.

For your guidance in a personal check-up of your health habits, you will find on the following pages a brief survey of each group of personal health habits, followed by a detailed list for individual checking.

## XV. A HEALTHY SKIN

We have learned that the skin is one of the organs of the body with important duties to perform. A healthy skin is soft and smooth, with the pinkish glow of the free, vigorous circulation of its blood-supply showing through from underneath. It is this blood supply which enables the skin to act as the great regulator of bodily heat. When there is too much heat in the body, the blood vessels in the skin expand and the excess heat escapes from the blood into the surrounding air. When there is a deficiency of heat in the body, the blood vessels in the skin contract and prevent undue losses of heat. The pores of the skin also help in heat regulation, allowing perspiration to reach the surface of the body. Additional bodily heat is used up in the evaporation of this moisture. There is some perspiration being secreted and evaporated all the time. The fact that perspiration contains some waste products of the body, adds the "elimination of waste" to the other important duties of this organ. This review of the uses of the skin would not be complete without adding that it is the organ of touch, temperature, and pain. Sensory nerve endings are widely distributed through it and help to keep us informed of conditions outside the body.

The position of the skin as the covering of the

body brings it into contact with the outside world. Its toughened outer layer protects the delicate structures underneath.

It keeps out dirt and disease germs as long as its surface remains uncut or unbroken. Because of exposure to many things, cleanliness is one of the best aids to a healthy skin and to the promotion of bodily health and well-being as a whole. A cleansing bath with soap and warm water should be taken at least twice a week. The best time for this is just before retiring. The warmth of the water has a soothing effect which favors sleep. The habit of taking a cold sponge or cold bath in the morning increases the tone of the skin and better accustoms it to the rapid changes in temperature to which it is so often subjected in winter.

The habit of keeping the skin clean is also one of the best ways to develop a feeling of self-respect and to gain and hold the respect of others. There is a very real feeling of being clean. After one has experienced the feeling of comfortable "cleanness," being dirty is actually "uncomfortable."

The health of the skin is very closely related to the general health of the body. Habits of living which provide ample opportunities for getting out of doors promote the health of the skin. An outdoor life insures to the skin the benefits of exercise, fresh air, and sunshine. Recent discoveries in connection with the beneficial effects of the ultra-

violet rays of the sun make outdoor life a greater need than ever before. The "tan" that results from continued exposure to sunlight is desirable from the standpoint of health, but precautions should be taken to prevent severe sunburn. The exposure to the sun should be gradual.

The diet has an important relationship to the health of the skin. The best diet is one in which the amount of body-building foods, heat and energy foods, and regulating and protective foods are properly balanced. Excesses in one or more of these groups often show themselves in skin disorders such as pimples or rash. Drinking plenty of water is also essential to a healthy skin. Several extra glasses a day in addition to that taken with the meals are necessary to replace that which is normally eliminated from the body. Regularity in movements of the bowels helps to keep the skin healthy. The effects of constipation are often noted in skin disorders.

Proper habits of living give the skin a naturally attractive appearance and minimize the necessity of seeking artificial beauty aids. The use of milks, creams or lotions after washing parts of the body that are exposed to severe weather conditions is helpful in preventing chapping or roughening of these surfaces. The habitual use of cosmetics for adornment is harmful to the skin. The pores become clogged, and sunlight is prevented from reach-

ing the surface that would be benefited most by this valuable aid to a healthy skin. Too often, cosmetics contain substances that are actually harmful to the tissue of the skin.

The face, neck, and ears need especial attention because they are more exposed to dust and dirt than other parts of the body. They should be washed upon arising, before retiring, and at such other times throughout the day as may be reasonably desirable. It is a good hygienic practice for each one to have an individual wash cloth and towel. In no case should such articles belonging to other people be used. Some very dangerous diseases are spread from person to person through contact with articles that are open to use by anyone in workshops, offices, and all public places.

### Care of the Hands:

Our hands are very useful tools and we use them constantly for many purposes. The habit of keeping the hands clean is closely associated with social as well as hygienic values.

There is a very definite social approval that is bestowed upon clean hands and clean, well-trimmed nails. The habit of appearing with clean hands in the presence of others is a form of respect that is genuinely appreciated. Clean hands prevent the soiling of books and other articles that come in contact with them.



One's own health and the health of others may depend upon clean hands. In the transmission of disease germs, three "F's" play a prominent part. The first of these is "*Fingers*." The other two are "Foods" and "Flies." The fingers come in contact with innumerable things and pick up dirt and disease germs from them. Precautions which help to keep these germs out of the body include the practice of keeping the fingers out of the mouth and the habit of washing the hands frequently. The hands should be washed with a mild soap and warm water before eating, after going to the toilet, and after any occupations that definitely soil them. They should be dried thoroughly after washing. If there is a tendency for the skin to redden, roughen, or "chap," rub a pure cream or lotion well into the skin after the hands have been thoroughly dried. This helps to make up for a deficiency in the secretions of the oil glands in the skin.

The condition of the finger nails can improve or detract from the general appearance of the hands. Clean, well-trimmed nails are attractive and help to gain the respect of others. Clean nails are hygienic because of the possibility of germs of disease lodging under dirty nails and then being transmitted to the body by way of the mouth.

The nails should be inspected and cleaned, if necessary, immediately after washing the hands. Nail files or orange sticks are useful cleaning in-



struments. The nails should be scrubbed occasionally with a small nail brush and warm, soapy water. The nails should be trimmed to conform to the shape of the ends of the fingers, but not cut down so close that the tender "quick" is exposed.

The toe nails should receive careful attention. They should be cleaned and trimmed regularly, preferably just after the bath. They should be cut almost straight across, and not too greatly rounded. Painful in-growing toe nails are often caused by trimming the nails too close to the quick, or by shoes with tight, narrow toes.

### Care of the Hair and Scalp:

The hair has often been referred to as the "crowning glory" of a woman's appearance. A man's hair is usually not such an important factor in his appearance, but, nevertheless, it can add or detract greatly from the general impression that is made. The hair also serves a purpose in protecting the head from blows, from sudden changes in temperature, or from the direct rays of an excessively hot sun.

The hair should be brushed to keep it orderly. Brush with firm but not too violent strokes. This will stimulate the scalp and improve the growth of the hair. Keep the brush and comb clean. They should be frequently washed with soap and warm water. Everyone should own an individual brush

and comb. Carefully avoid using brushes and combs that may be found in public places or brushes and combs used by other people. It is dangerous to do so. Vermin and scalp diseases are frequently transmitted in this way.

The hair is exposed to the dust of the air. It becomes soiled more quickly under some conditions than others. On windy days, during sweeping and other house-cleaning operations, and in "dusty trades it is impossible to keep the hair clean unless a close-fitting headdress of some kind is worn for the purpose. The hair also becomes dirty from the perspiration and oil secretions that reach the scalp from glands located in the inner layer of the skin. The tiny scales of dead skin that are constantly peeling off from its outer layer catch in the hair and help to soil it.

The frequency with which the hair should be washed depends upon a number of things. If the conditions of work or play are dusty and dirty, the hair needs to be washed frequently. If the hair is naturally oily, it can be washed oftener than if it has a tendency to be dry and brittle. It is safe to say, that, under ordinary conditions, a girl's hair should be washed once or twice a month to keep it clean and a boy's hair once a week or oftener as needed. Use warm water and a pure, mild, oil soap. Rinse thoroughly and dry it in the sun, if possible.

Hair is easier to care for when it is properly

trimmed. Well trimmed hair gives a feeling of comfort and has a social value as well. Only sanitary barber shops or beauty shops should be patronized. This precaution will help in protecting against scalp and skin diseases that are sometimes transmitted by unhygienic methods in such places.

### RELATED HEALTH HABITS

#### For Individual Check-Up:

1. Always wash your hands:
  - On arising
  - Before meals
  - Before preparing food
  - Before going to bed
  - At other times when necessary.
2. Wash the face, neck, and ears:
  - Each morning when you get up
  - Each night before you go to bed
  - Whenever else it may be necessary
  - Use soap and wash cloth.
3. Keep the wash cloth clean:
  - Have one of your own
  - Rinse it out
  - Hang it up to dry.
4. Wash the body:
  - Each morning—cool water
  - At least two warm baths each week.
5. Use your own towel and wash cloth
  - Avoid the use of public towels.
6. Clean the finger nails:
  - In the morning
  - Before meals

- Before going out anywhere
- After dirty work or play
- Before going to bed.
- 7. Follow these directions (care of the nails):
  - Use a small brush, soap, and warm water
  - Use an orange stick, or file
  - Push back the skin
  - Do not trim too close to the quick.
- 8. Trim and clean the toe nails:
  - At bath-time
  - Do not let them grow too long
  - Do not cut them too short
  - Trim them almost straight across
  - Avoid shoes with narrow toes.
- 9. Brush your hair well, using good strong strokes
  - Each morning
  - Each night
  - Before meals
  - Whenever else it may be necessary.
- 10. Wash your hair:
  - With warm water and soap
  - Rinse with cool fresh water
  - Not too frequently.
- 11. Keep the comb and brush clean.
- 12. Observe the following:
  - Eat wholesome food
  - Drink plenty of water
  - Observe regular elimination
  - Exercise in the fresh air and sunshine
  - Get plenty of rest and sleep
  - Avoid overuse of cosmetics.
  - ("Paint your cheeks from the inside.")

## XVI. CARE OF THE MOUTH AND NOSE

The mouth has been referred to as a "port of entry" to the body. It is the "receiving station" for the food and drink the body needs. It begins the processes of digestion by the mechanical action of the teeth in grinding up the food and by the chemical action of the saliva in changing starchy elements into sugar. The mouth is also an avenue of entrance for the air that is received into the lungs. In this work, however, the mouth is second in importance to the nose because health is promoted by nose breathing rather than by mouth breathing.

One of the commonest ways that disease germs get into the body is through the mouth. The germs may gain an entrance in the foods we eat, in the air we breathe, and from contact with articles that may be placed in the mouth. The dangers from disease germs will be lessened if fingers, pencils, and other inappropriate things are kept out of the mouth. Do not exchange partly eaten things with others. Scrupulously avoid the use of common drinking cups. In many states, these are forbidden by law in public places, but still are found in workrooms and places where many people have access to the same receptacle.

The mouth is one of the important agencies

through which disease germs get *out* of the body and spread from person to person. Germs of respiratory diseases, like colds, influenza, and pneumonia, are often ejected forcefully on little droplets of moisture during coughing and sneezing. A handkerchief should be held over the mouth when we cough or sneeze in order to prevent the spread of the germs.

Spitting spreads germs. After the moisture of the sputum dries out, the germs are free to blow about on the dust in the air. Spitting is one of the most dangerous practices connected with the spread of tuberculosis, and especial care should be taken against this dread disease.

The tonsils have been found to be favorite places for the harboring of germs of disease. Infected tonsils form "foci" of infection and the slow but constant absorption of the poisons from them are often responsible for heart trouble, rheumatism and chorea or "St. Vitus' Dance." Tonsillitis results from an active growth of germs in the tonsils.

### **Care of the Throat:**

A sore throat is one of the early symptoms of a number of diseases. Competent medical advice and proper corrective treatments should be promptly obtained whenever such conditions first appear.

### **Care of the Teeth:**

The teeth form an important part of the "equip

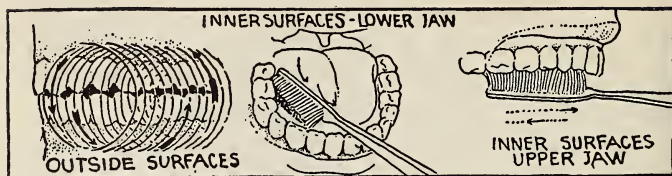


ment" of the mouth. They aid in preparing food for digestion, help in the formation of a number of the sounds used in our speech, and contribute materially to an attractive appearance.

The commonest ailment of the teeth is a disease called "dental caries" or "decay" of the teeth. When food particles, especially sweet and starchy ones, are allowed to remain in contact with the teeth, bacterial growth occurs, and harmful acids are formed. These acids slowly destroy the enamel. When the decay reaches the softer "dentine" or "cementum" beneath the enamel, it progresses more rapidly and soon gets to the pulp with its nerves and blood vessels. Cleanliness is the best protection against "dental caries." The teeth should be brushed morning and night and after meals. Brushing the teeth should be a serious matter and a good method or technique should be developed and made into a habit. Dental authorities sometimes differ as to what is the one best method of brushing the teeth. The two methods presented below have ardent supporters among these experts. The "circular method" is in most common use. In the modified circular method the brush movements always start on the gum surfaces and sweep downward over the teeth.

### **The Circular Method:**

With a large straight brush clean the different surfaces as follows:



### THE CIRCULAR METHOD

(a) *Outside Surfaces:* Place the toothbrush inside the left cheek and on the upper gums and nearly close the teeth, make the brush go backward and downward to the lower gums, then slightly forward and upward until it has traveled a complete circle. The circular motion should be done rapidly so that the gums will be stimulated and the teeth cleansed of food. Keep up this fast circular motion and brush all the teeth on the left side as well as all of the front teeth. Do not brush the teeth and gums crosswise. Now brush the right side with the same circular motion, or reversing the circle, if found more convenient. Brush long enough to stimulate the gums thoroughly and cleanse the teeth, going back and forth over the surfaces several times.

(b) *Inside surfaces of upper teeth and roof of mouth:* With the bristles of the brush pointing upward and the end of the thumb on the back of the handle, brush the roof of the mouth and the inside gums and surfaces of the teeth with a fast in-and-

out stroke, reaching back on the gums as far as you can go. Go back and forth across the roof of the mouth with this in-and-out stroke at least four times.

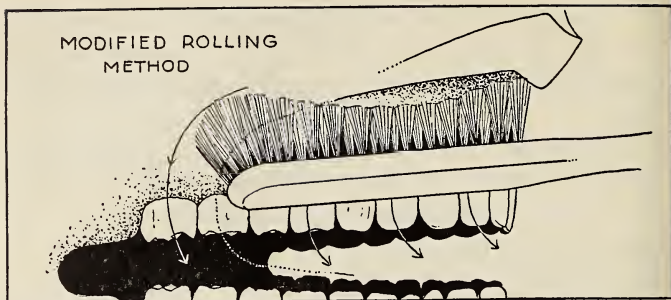
(c) *Inside surfaces of lower teeth and gums:* Hold the handle of the toothbrush in the fist with the thumb lying across the back of the handle and brush the gums and teeth with an in-and-out stroke, using chiefly the tuft end or toe of the brush. Reach back in the mouth on the gums below the last tooth on both sides and brush with a fast, light, in-and-out stroke. Tip the handle of the brush up in brushing the gums back of the lower front teeth.

(d) *Tops of teeth or grinding surfaces:* Lastly, brush the teeth with an in-and-out stroke on the surfaces on which you chew, as the food must be removed from the grooves or fissures on the molars.

### **Modified Rolling Method:**

Another method sometimes recommended by dentists is the Modified Rolling Method. Use a small brush, first with the upper teeth, and then with the lower teeth, as follows:

*Upper Teeth:* Grasp the toothbrush handle firmly with the bristles pointing upward and place the toothbrush in the mouth between the cheek and gums as far back as the last tooth, laying the sides of the bristles against the gums. Then, sweep down-



ward over the gums and teeth by rolling the handle of the toothbrush and wrist inward. Repeat this in the same location several times until the teeth are clean; then, move the toothbrush forward to the next group of teeth not reached by the first position and so continue until all the outer tooth surfaces are cleansed and the gums massaged, always remembering to place the ends of the bristles up and the side of the bristle part of the brush against the gums before rolling the handle. Clean the inside surfaces of the upper teeth in the same manner.

*Lower Teeth:* The lower teeth are cleansed similarly, except that it is, of course, necessary to turn the ends of the bristles downward before placing the brush in the mouth and laying the bristle part of the brush against the gums. Then sweep upward over the gums and teeth, as often as required in

each location. Clean the inside surfaces of the lower teeth in the same manner.

*The Grinding Surfaces:* In order to clean the grinding surfaces, the brush is placed with the bristle ends against the grinding surfaces of the teeth and the handle held in the palm of the hand. A group of two or three teeth are brushed at a time. The handle is given a short to-and-fro motion, rocking the bristle ends carefully into the grooves and pits. The bristles do not jump from tooth to tooth, but remain working in one spot. The pressure should be sufficient to scour the deepest grooves in the teeth and not flatten or crush the bristle tufts. The brush is then moved to a new group of teeth and so on, until all the grinding surfaces are cleaned.

### **Other Factors:**

Diet is perhaps the fundamental factor in having good teeth. Teeth need calcium or lime for hardness. Foods like milk, green vegetables, and cereals should be plentiful in the diet, especially during the years when the teeth are growing and pushing through the gums to their proper places in the mouth. Vitamin D is also essential. Exercising or stimulating an increased flow of blood to the teeth and gums by occasional chewing of "crisp" or "crusty" foods is beneficial. Biting nuts, candies, and other hard things should be avoided, how-



ever, because of the danger of cracking the enamel covering of the teeth.

Under certain conditions bacteria find their way into the root canals of teeth and into the tissues surrounding them. The growth of these bacteria results in the formation of "pus" or "poison" which forms an abscess. If the growth is rapid, the abscess becomes very painful and immediate relief must be obtained. Sometimes the growth is so slow that the poisons are absorbed as fast as they are formed and the person is often ignorant of their presence until the outbreak of trouble somewhere else in the body. In many cases a direct connection has been found to exist between rheumatism, heart disease, and a "focal infection" at the roots of teeth. Dentists and physicians look with suspicion and disfavor upon "crowned" and "devitalized" or dead teeth, because of the frequency with which such infections are found at their roots. The X-ray has proved to be a valuable aid in locating such danger spots. Everyone should realize that it is desirable to save and preserve the teeth as long as possible, but that infected teeth should be promptly removed.

Pyrrrohea is a disease which produces "foci" of infection and often causes the loss of the affected teeth. The germs of this disease find an entrance for their destructive work around the edges of the gums whenever they are irritated or inflamed by



accumulations of "tartar" or by ill-fitting crowns or sharp fillings in teeth. The infection gradually works down along the roots of the teeth, forming pus, and destroying tissue as it progresses until the teeth become loosened in their sockets. Prevention is the most successful method of combating this disease. Competent treatment should be obtained at once whenever any inflammation appears in the gums. Tartar should be regularly removed by a dentist, and the teeth kept smooth and clean.

In order to keep the teeth sound and healthy, one should form the habit of having the teeth inspected by a competent dentist at least once every six months. This is a good form of "health insurance" that is at once cheap and effective. Regular inspections at frequent intervals enable the dentist to discover and check decay before it gets a real start. It brings to light any dangerous conditions that may lead to later abscesses or pyorrhea. It affords frequent opportunities for the thorough and professional *cleaning* that makes the teeth look their best. If these inspections are made regularly, the dentist often will find no cavity or decay to treat, and we have the satisfaction of knowing that our teeth are in the best possible condition.

### Care of the Nose:

The nose is the "port of entry" to the body best equipped to receive air for the lungs. The cells in

the lungs are so delicate that the air that reaches them should be warmed to the temperature of the body, be saturated with moisture, and be free from particles of dust. The narrow, curved nasal passages are much better suited to warm the air, saturate it with moisture, and remove particles of dust than the more direct passage through the mouth. The nasal passages are lined with moist mucous membrane. The moisture helps to catch the dust particles and has a mild germicidal or germ-killing power of its own.

Breathing through the nose may be interfered with by abnormal growths of tissue, or nasal obstructions, as they are usually called. Adenoids are masses of spongy tissue which grow in the upper back part of the throat. Enlarged adenoids often partially block the air passages in the upper throat and so cause "mouth breathing." Such obstructions should be removed.

The continual secretion of mucus and the abstraction of dust and dirt from the air as it passes through the nose, makes the cleaning of this organ an important duty. The first requirement for this purpose is a clean handkerchief. The nose should be blown gently. It is a good plan to clean the nasal passages upon arising each morning, and before retiring at night, and at such other times as may be needed. There are a number of social conventions which have grown up around this hy-

gienic practice. One should use only his or her individual handkerchief. It should be changed often enough to keep a clean one always ready for use. A soiled handkerchief is unhygienic and displeasing to the sight of others. When one has a cold there is an increase in the secretion of mucus. Handkerchiefs need to be changed much more frequently at such times.

The cleaning should be done in private whenever possible and should be avoided entirely at the table. If the handkerchief must be used at the table, it should be touched lightly to the nose as a temporary measure until more suitable opportunity is obtained for a more thorough cleaning or clearing of these passages. Picking the nose is a disgusting practice that has possibilities of danger from resulting infection as well. In sneezing, the air is expelled forcibly through both the mouth and nose. It is courteous and hygienic to place a handkerchief over the mouth and nose before this violent act of expiration, rather than merely using it to clear the nasal passages afterward.

### RELATED HEALTH HABITS

#### For Individual Check-Up:

##### A. Oral Hygiene:

##### 1. When to brush the teeth:

Before breakfast

After each meal if possible

Before going to bed.

2. How to brush your teeth:  
The Circular Method, or  
The Modified Rolling Method.
3. When brushing the teeth:  
Brush the gums  
Brush the roof of the mouth.
4. Other points:  
Use dental floss or a soft pick before  
brushing  
Before going to bed is the most important  
time for cleaning teeth  
Use a light, fast stroke  
Do not use a brush after the bristles be-  
come flat  
Brush your teeth for two full minutes, or  
count a certain number of strokes  
Massage the gums.
5. Take proper care of the toothbrush:  
Have one of your own; permit no one else  
to use it  
Rinse it after using  
Keep it in a clean place  
Put it in sunlight to dry whenever possible.
6. Other things to use:  
Clean water—running water  
Tooth paste or powder  
A mouth wash.
7. Visit the dentist every six months:  
For examination  
For preventive (prophylactic) treatment  
For a good cleaning.
8. Save your teeth:  
Have them filled, not pulled  
Make them last a lifetime.

9. Eat the right kind of food:  
Foods that contain calcium  
Coarse foods that exercise the gums  
Not too many sweets.
10. Get plenty of vitamin D—"the calcium builder":  
From foods and cod-liver oil  
From exposure to sunlight.
11. Do not drink from a common or public drinking cup.
12. Avoid plates or eating utensils that have been used by others, unless they have been washed.

B. Nose and Throat:

1. Keep the nose clean.  
Attend to it in private  
Clear before retiring  
Again on arising.
2. Avoid coughing or sneezing in the presence of others.  
Use a handkerchief  
Turn head aside  
Excuse yourself if others are present.
3. Breathe through the nose.  
Enlarged adenoids should be removed.
4. Diseased tonsils should be removed.
5. Keep hands away from the nose and mouth.

## XVII. CLOTHING

Clothing has both physical and social values. It helps in physical processes like the regulation of bodily heat, and it is an important factor in one's appearance. Clothing has an intimate relationship to one's person. The choice of clothing and the care that is taken of it are important expressions of one's training and character.

In the choice of clothing, decisions often have to be made between hygienic qualities and stylish fads, because the dictates of fashion are not always in accord with healthfulness. From the point of view of helpfulness in the control of bodily heat, the clothing should be selected according to the season of the year and the occupation. Wool is best for winter wear, while cotton, silk, and linen in light colors are better suited for summer wear. Clothing should also be as light in weight as is consistent with proper protection. Most buildings are so well heated in winter that heavy clothing is unnecessary indoors. Extra clothing should be put on for outdoor wear but removed when coming indoors again. Overshoes and rubber boots are for outdoor wear only and should always be removed indoors. Such rubber articles prevent circulation of air through them and the evaporation of the perspiration that is secreted beneath them.





### *WEAR SUITABLE CLOTHING*

Wet clothing in cold weather is dangerous because the moisture conducts heat from the body very rapidly. A change to dry clothing should be made as soon as possible and vigorous exercise taken at once to offset the rapid heat losses from the body.

Clean and neat clothing is a mark of good breeding and an asset in social and business life. Underwear should be changed frequently. A clean body deserves clean clothing, so the underwear should be changed after a bath. Some outer clothing is washable and can be kept clean in this way. Many satisfactory cleansing fluids are available for removing spots from clothes that cannot readily be washed. Clothes should be pressed whenever needed to keep them neat and well appearing. Outer clothing should be kept on hangers when not in use. Winter clothing should be cleaned and stored away in summer so that moths cannot damage it. Summer clothing should be cleaned before it is put away for the winter.

**RELATED HEALTH HABITS****For Individual Check-Up:**

1. Do not wear tight clothing:  
Tight waistbands  
Tight garters  
Tight shoes.
2. Take proper care of the underclothing:  
Change frequently  
Change after exercise  
Wear only clean underclothing  
Change more frequently in summer  
Air during the night.
3. Take proper care of night clothing:  
Keep off the floor  
Air during the day  
Always wear clean night clothes.
4. Outer clothing:  
Cotton, silk, and linen for summer  
Wool and fur for the winter  
Rubber for wet weather  
Do not wear rubber footwear indoors  
Wear clothing to suit the weather  
Wear clothing to suit the occasion  
Dark colors in winter; light colors in summer.
5. Take proper care of outer clothing:  
Clean; neatly pressed  
Wash suits occasionally—at home or send to  
tailor  
Always hang clothing up to air  
Store summer clothing away in winter  
Store winter clothing away in summer  
Keep shoe-trees in shoes when not being worn  
Rubbers and boots should be kept in a dry place  
Remove wet clothing as soon as possible.

## XVIII. FOOD

Two extreme viewpoints connected with foods and nutrition are tersely stated by the expressions "Eating to Live" and "Living to Eat." Those who eat merely to supply bodily needs deny themselves the mental stimulation and growth that can be obtained from cheerfulness and sociability at meal-time. On the other hand, those who "live to eat" overdo the relative importance of this necessary act. Such people usually eat too much and help to give truth to the statement sometimes heard that more people are killed by overeating than by a lack of food. The keynote of problems connected with food and nutrition is "*moderation.*"

A balanced diet is essential to health. Such a diet supplies the right proportions of all the different kinds of food the body needs. There must be foods for growth and repair of the tissues, for heat and energy, and for the protection and regulation of bodily processes.

Protein foods are essential for the growth and repair of the tissues of the body. "Good proteins" include lean meat, eggs, cheese, milk, nuts, dried peas and beans, lentils. During the years of growth the body needs more protein foods than at other stages of development. This extra supply should be obtained from the more digestible protein-contain-

ing foods like milk and cereals than from eating an excess of meats and some other less digestible ones. A continued excess of protein in the diet is harmful to the kidneys in some cases because of the extra work they are called upon to do in eliminating the dangerous waste products that are formed when proteins are used up in the body. Meat not more than once a day is a good rule to follow in balancing the diet.

The chief sources of heat and energy are the so-called "fuel foods." These are the starches and sugars, and the fats and oils. See lists of foods on pages 490-491 for proportions of fuel elements in foods. In the human body the fuel elements in our foods are burned up or oxidized in the tissues. Heat is produced and energy is released to run the human machine and to keep important processes "going" as long as life exists. The carbon dioxide that is formed as a waste product of oxidation passes out of our bodies through the lungs in the expired air.

The amounts of fuel foods needed by the body vary from time to time. Increased muscular activity increases the need for fuel. Different kinds of work call for a larger or smaller number of calories a day, according to the differences in muscular activity involved in the work. The season of the year makes a difference in the amount of fuel foods that should be eaten. More is needed in cold

weather than in hot weather. Fats and oils contain about twice as much heat value as the starches, sugars, and the proteins. In hot weather the amount of foods rich in fats and oils should be greatly reduced.

Foods with an "ash" that assists in maintaining the natural alkalinity of the blood are to be preferred to foods with an acid-forming ash. Alkalinity of the blood helps to resist the spread of most disease germs within the body.

Regulating and protective foods help to keep important bodily processes performing properly and protect against diseases and irregularities of growth. Regulating foods include:

1. Bulky, or coarse foods, such as vegetables, fruits, and cereals from which the outside covering or bran has not been removed.
2. Foods containing minerals and mild acids, such as milk, cereals, vegetables, and fruits.
3. Water.

## **Protective Foods Are Those Which Contain Vitamins:**

"Vitamin A" is necessary for normal growth. These vitamins are found in milk, butter, egg yolk, cod-liver oil, and the green, leafy vegetables, such as lettuce, spinach, and green cabbage.

The "B" vitamins are also essential to proper growth. They protect us against pellagra and

beri-beri. These vitamins are widely distributed in many different foods. They are found in most vegetables and fruits. They are more abundant in whole grained cereals than in the prepared or milled form of these foods. Milk, yolk of eggs, liver, kidneys, and brain tissues of animals are rich in them.

"Vitamin C" protects against scurvy. This vitamin is plentiful in green vegetables and fruits. It is especially abundant in tomatoes, oranges, and lemons. It is more easily destroyed by heat or drying and is, therefore, especially associated with fresh or uncooked foods.

"Vitamin D" protects against rickets. This vitamin is found principally in some oils and fats, and is especially abundant in cod-liver oil. See list on page 209 for vitamin-containing foods.

In planning a balanced diet, the amount of money to spend is an important item. It may reduce the variety of foods that may be selected but it need not prevent one from selecting the proper kinds. The cheaper cuts of meat contain the same good protein elements that are found in the expensive ones. The common and cheaper vegetables supply the regulating and protective elements as well as the rarer and more expensive kinds. Buy plentifully of vegetables and fruits in season. Select combinations of different foods so that any deficiencies in regulating or protective elements in





### NUTRITION AND HEALTH

*The food supply should be adjusted to individual needs. Age, sex, occupation, climate, and physical conditions are factors that must be considered.*

some will be made up by their abundance in others. The more foods we eat (in season), the easier it will be to plan a balanced diet. The more refined foods we eat, like highly-milled white flours, polished rice, sugar, and candy, the more care we must take to make up in other ways for the deficiencies of mineral salts and vitamins in these foods.

An important check upon the suitability of the diet to the needs of the body can be obtained from occasional comparisons of one's own height and

weight with predetermined normal standards for these bodily conditions. For those who have not reached maturity, it is important that a steady, even though slight, gain in height and weight be made. Measure your height about three times a year, and your weight at least once a month. The closer one approaches to maturity, however, the more imperceptible become the gains.

Just when underweight and overweight become dangerous is not exactly agreed upon by all experts. A safe rule to follow seems to be that if you are from seven to ten per cent underweight or about twenty per cent or more overweight, you should consult a physician and try to find out the reasons for these excessive variations from the normal and, if advisable, do all possible to reach a healthier relationship between the height and weight.

Overweight is usually due to an excess of fuel foods together with a lack of exercise. The extra fuel elements are stored up in the body as fat. Overweight usually develops slowly and time should be taken for its relief. In reducing sensibly, eat less butter, cream, cheese, fat meats, nuts, and oil dressings. Substitute fruit for rich desserts. Reduce the carbohydrate part of the diet by substituting green vegetables for some of the starches and sugars. Take second helpings only of lettuce, celery, spinach, cabbage, and other foods of small fuel value. Candy and pastry should be entirely omitted

or at least greatly reduced. Exercise is an important part of a reducing program. An outdoor walk or a lively game uses up some of the stored up fuel deposits in the body and helps to promote the reduction in weight.

Being too much underweight is a serious body condition that should be removed as soon as possible. If the underweight is due to malnutrition, the causes of this disease should be removed. Diseased tonsils and infected teeth pour poisons into the blood stream and prevent the body from making the fullest use of the foods that are eaten. Underweight may also result from overfatigue, brought on by too much activity and too little rest and sleep. Other causes include poor food habits and improper food choices. These include such things as eating at irregular times, eating candy and sweets between meals, eating too rapidly, over-indulgence in tea, coffee, and other stimulants. In underweight cases, the resistance of the body is sometimes reduced, and diseases which otherwise might be prevented, get a start.

The mealtime should be one of cheerfulness and sociability. The progress of the meal should be leisurely, allowing sufficient time for thorough chewing of the food. Enjoyment of the meal will be increased and digestion promoted when the food is carefully and attractively prepared and served in clean and neat surroundings.

## RELATED HEALTH HABITS

## For Individual Check-Up:

1. Learn to like all kinds of healthful food. Balance your meals.
2. Some fresh fruit every day.
3. At least one fresh vegetable every day.
4. Avoid too much candy or cake.
5. One quart of whole milk each day.
6. Eat foods suitable to your age and condition.
7. Eat food suitable to the season of the year.
8. See that the food is kept clean:
  - In a cool place
  - Away from flies, bugs, and mice
  - Away from dust or dirt (keep covered)
  - Dishes and containers should be kept clean.
9. Be sure that food is prepared in the most wholesome manner.
10. Your balanced diet should contain:
  - (a) Some raw foods
  - (b) Some green vegetables
  - (c) Some bulky foods
  - (d) Some protective foods
  - (e) Some regulative foods
  - (f) In addition, the usual "balance" of
    - Proteins
    - Carbohydrates
    - Fats and oils
    - "Mineral" foods
11. Avoid too much acid-forming food.
12. Be cheerful and courteous.
  - Observe "table etiquette."

## XIX. POSTURE

Good posture helps to preserve the natural symmetry and the proportions of the body. It affords a healthful freedom of movement for the vital organs. It lessens the weakening effects of fatigue. Proper standing, sitting, walking, running, and reclining positions can easily be made a habit if the necessary conditions are fulfilled.

The *bony framework* is the foundation upon which good posture is built. Correct body positions depend upon the normal growth and development of bones. Good *muscle tone* is essential to proper posture. The muscles must be strong enough to hold the body in proper position for extended periods of time. Muscle development should be symmetrical so that the muscles on one side will not be stronger than those on the other and pull parts of the body into improper positions. The *mental attitude* toward posture is important. In addition to knowing the correct body positions, one must have the desire and will power to persist in maintaining them until the desired habits are formed.

Standards should be used occasionally to check up on one's posture. For example, proper standing position is outlined as follows:

1. Chest up, shoulders back, chin drawn in.
2. Feet parallel, with toes pointing forward.

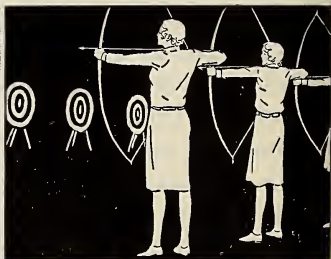
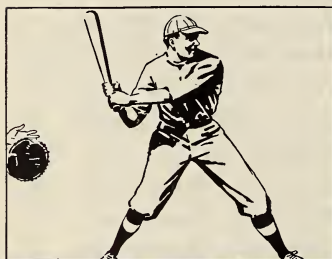
3. Arms at side.
4. Stand as tall as possible without straining or overdoing it.

The proper sitting position is as follows:

1. Sit firmly, with body erect.
2. Sit well back in the seat.
3. Rest the feet flat upon the floor.

Correct walking posture:

1. Chest up, shoulders back, chin drawn in.
2. Let the heel touch the ground first.
3. Point the toes forward so that the weight of the body will be distributed evenly over the ball of the foot.



*POSTURE! POISE!*



### Good reclining or sleeping position:

1. Lie on right side so that the heart may beat freely.
2. Keep back straight and knees slightly bent.
3. Use no pillow or as low a pillow as possible under the head.

Improper posture is often due to carelessness. In youth, the bones are softer and more pliable than in later years. Care should be taken to prevent postural defects from developing during the growing years. Other causes of improper posture are inadequate diet, and a disease called malnutrition. In such cases the muscle tone is poor and the muscles tire easily. They are incapable of holding the body in the proper positions for very long. Slouched or defective posture soon results.

Corrective exercises are helpful in relieving postural defects. Certain exercises will benefit stooped shoulders, others will strengthen weak ankles, and so on. They should be planned by an expert to give the best results.

### Care of the Feet:

The feet support the weight of the body in positions like standing, walking, and running. The bones of the feet are arranged in the form of arches. Ligaments and muscles bind these bones together and help to give elasticity and springiness to the step.

Properly fitted shoes help to give support to the

arch of the foot where it is needed. Improperly fitted shoes force the feet into incorrect shapes and throw the weight of the body upon muscles in the foot and leg that are not able to stand the strain of this extra work. Painful and serious foot disorders result. The requirements of a properly fitted shoe are as follows:

1. The shoe should be neither too large nor too small.
2. It should be long enough so that the toes do not press against the front of the shoe.
3. It should be wide enough so that the foot will rest flat upon the sole.
4. The heels should be broad and low.

Poor nutrition weakens all the muscles of the body. This affects the muscles which hold the long arch of the foot in place. The arch turns gradually inward until the condition known as "flat foot" results. The cure and relief of weak feet and flat feet is a matter of expert advice and attention. Rest the feet as much as possible. Strengthen the muscles of the feet by massage and proper corrective exercises. Give special attention to the diet in order to build up improved muscle strength, and tone.

### RELATED HEALTH HABITS

#### For Individual Check-Up:

1. Sitting:

Body erect

Weight on full length of thigh bones

Feet flat on floor

Toes to front.

2. Standing:

Chest up, chin in

Shoulders back

Feet parallel

Heels together

Arms at side

Stand as tall as possible, without straining.

3. Walking:

Body erect as when standing

Walk naturally

Point the toe forward

Let the heel touch the ground first.

4. Running:

For a short run (sprint):

On toes

Hands clenched, and arms raised.

For a long run:

On sole of foot and toes

Arms hang at sides, swinging slightly.

5. Sleeping:

Lie on the right side

Back straight, knees slightly bent

Low pillow or none at all.

6. Practice corrective exercises for postural defects.

7. Wear proper shoes (length, width, shape).

8. Avoid high heels.

9. Observe good posture on all occasions:

Social

Business

Recreative.

## XX. EXERCISE

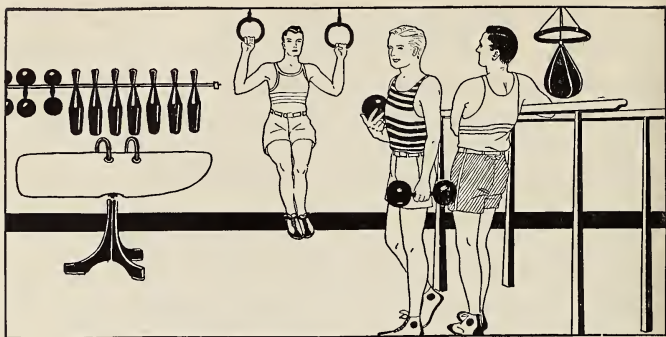
Exercise or muscular activity is one of the essentials of growth. It results from the action of muscles. Muscles are made up of bundles of slender fibers. The fibers are composed of cells. Each muscle cell is a tiny "living engine," producing energy through the oxidation or burning up of fuel, and forming waste products which have to be carried away promptly. The blood is the means by which the "fuel" is brought to the cells and the waste products removed. Muscle cells are supplied with nerves. This enables the central nervous system to direct and control the energy that is produced and turn it into useful and desirable forms of activity or exercise.

Exercise enables muscles to grow in size and strength and to develop good tone. The effects of exercise upon the growth and development of muscles is appreciated more clearly when attention is directed to conditions of overdevelopment or underdevelopment. The constant swinging of heavy hammers may overdevelop the muscles in a blacksmith's arms. On the other hand, when a broken arm or leg is held motionless for several weeks, the muscles become weakened through lack of exercise. After the injured part has healed and exercise resumed, the muscles soon return to their former size and strength and regain their tone.

Permanent effects of the lack of exercise upon muscles are observed in cases where an arm or leg has become paralyzed. The stricken part often presents a shriveled appearance and is much smaller in size than muscles in other limbs that have the beneficial and stimulating opportunities for exercise.

Exercise promotes vigorous action of the heart, lungs, and other vital organs of the body. During exercise the demands of muscle cells for fuel are increased and there are more waste products to be carried away. To meet these needs, the heart beats faster and speeds up the circulation of the blood. Breathing becomes more rapid to supply additional oxygen and to eliminate the extra waste carbon dioxide that is formed at this time. It is one of the fundamental principles of life that a healthy organ or structure is strengthened by doing the work for which it was intended. It follows, therefore, that exercise is of great benefit to the vital organs of the body and helps to promote their growth and vigor. The training period before athletic contests is of great importance in preparing for the severe strains of active competition.

Exercise is an important aid in the development of the nervous system. All muscular movements are directed and controlled by nervous impulses. These originate in the central nervous system and reach the muscles by way of the motor nerves.



### EXERCISE

New movements call for new connections between nerve cells. Increases in skill in muscular movements are accompanied by corresponding improvements in the quality of the connections among the neurones or nerve cells of the nervous system.

Exercise includes the muscular activities of both play and work. Free, spontaneous play and games are among the best forms of exercise. Athletic sports are also valuable. Most of these forms of exercise bring large numbers of muscles into action and train groups of muscles to work together. The fact that they are usually carried on outdoors is an added gain. The widest benefits from athletic sports are obtained when opportunities are provided for large numbers of students to participate in them. "Inter-class" contests within the school should be organized to meet this need. "Inter-



school" contests between representative teams are valuable for the development of good school spirit and sportsmanship, but provide actual physical exercise for only a very small part of the student body.

Exercise should not be carried to extremes. Experts recommend that every boy and girl of high school age should get about two hours of outdoor play or work activity each day. If this plan is adopted, there will be but few days throughout the year when it will not be possible to be outdoors if precautions are taken to suit the clothing to the weather. Too much exercise will do harm to the muscles and the nerves which supply them. Overexercise is especially dangerous to the heart. The heart enlarges slightly during normal exercise, but if exercise is regularly overdone, the enlargement may persist and weaken rather than strengthen this important organ. Overexercise of any particular group of muscles is harmful. It destroys the balance and symmetry of development that is associated with normal, healthful growth.

Exercise is closely connected with fatigue. Fatigue is a condition of muscle exhaustion that is caused by an accumulation of waste products in the muscle cells. It results from long, continued activity. Its effects show themselves in a lessened ability to work, and in the feeling of being tired. Vigorous exercise up to the point where

one feels tired is beneficial if the warning signals of fatigue are heeded in time. The fatigue that is removed by rest periods throughout the day or by a night's sleep is natural and does no harm. Chronic or excessive fatigue is harmful. This is the condition when one wakes up tired after a night's rest. Persons suffering from it are not interested in vigorous exercise or active games. Excessive fatigue may be due to long continued exercise without allowing time for rest, from late hours, or overexcitement. Poisoning from abscessed teeth or diseased tonsils lowers muscle tone and predisposes to fatigue. Expert medical attention should be sought to find its cause and plan for its relief and cure.

Healthful outdoor exercises and games include running, jumping, and throwing; sports like swimming, skating, hiking, and tennis; competitive games, such as baseball, dodge ball, basketball, and track and field events; social recreation like folk dancing and rhythmic games of many kinds. Besides the physical benefits from these activities there are valuable social benefits obtained as well. These include qualities like leadership, courage, presence of mind, and coöperation. Mental development is stimulated by opportunities for expression of ideas through activity. It affords relief from worry. It provides healthful relaxation for persons whose work is quiet and inactive.

## RELATED HEALTH HABITS

## For Individual Check-Up:

1. Play and exercise for:
  - Muscle tone and skill
  - Social enjoyment
  - Character formation
  - Recreation.
2. Avoid:
  - Overexertion
  - Exhaustion or chronic fatigue
  - Too much competition
  - Competition without training
  - Overtraining
  - Catching cold after exercise.
3. Give outdoor sports the preference.
4. A change of work or form of activity can often be used for exercise.
5. Special exercises may be used for increase in specific muscular development or skill.
6. Do not take unnecessary risks.
  - "Save yourself for better adventures."

## XXI. REST AND SLEEP

Rest should follow exercise as an important essential of growth. During muscular activity fuel is produced, and waste products are formed. If the activity is kept up too long, the normal fuel supply becomes exhausted and the tissues themselves are consumed for fuel.

Waste products accumulate and clog up the cells. They spread their poisons throughout the body, causing fatigue. Rest is the time for the renewal of the food supply, for the restoration of the worn-out tissues, and for the promotion of growth. The accumulation of waste materials is also carried away during such a time. If there is a proper balancing of work, play, and rest in the habits of life, rest is normally followed by periods of freshness and renewed vigor. Because of the growth that is involved, there is an actual increase in one's powers and capacities.

During periods of rest there should be as much relaxation of muscles as possible. It is for this reason that sleep is one of the best forms of rest. The benefits of sleep are greatest when the most favorable conditions are provided. One should sleep alone whenever possible in order to obtain complete relaxation. The windows should be opened at the top and bottom for good circulation of air and

enough bed clothing provided to keep the body comfortably warm. Growth and health are best promoted when regular hours of sleep are observed. The amount of sleep needed varies somewhat with the age of the person. During the high school years from nine and one-half to ten hours have been recommended. Adults can maintain health, as a rule, on an average of from seven to nine hours a day. Form the habit of retiring and rising at about the same time each day, allowing as few exceptions or interruptions to the schedule as possible. A healthful position for sleep is that of lying on the right side, with the muscles relaxed.

### RELATED HEALTH HABITS

#### For Individual Check-Up:

1. Balance work, rest, and recreation.
2. Regulate amount of sleep according to work, strain, condition, and age.
3. Go to bed early enough to wake up naturally in the morning (no "alarm," or call).
4. Have a regular hour for retiring.
5. A short nap or period of relaxation during the day is often helpful.
6. Get rid of body waste before going to bed.
7. Remove all day clothing. Wear night clothes.
8. Open windows.
9. Sleep in the dark.

In a quiet place.

Well covered, but not too warm.

Alone, if possible.

## XXII. ELIMINATION OF BODY WASTES

The human body is a living "going" machine. The production of energy is a continuous process, more energy being needed during periods of activity and less required during the hours of sleep and rest. In the production of this energy fuel is consumed, and waste products are formed. Additional waste materials accumulate in the process of digestion. Waste products must be promptly eliminated in order to prevent harmful effects to the body.

The waste products of digestion consist principally of food materials that are not assimilated or taken into the blood stream to be used for fuel or growth. After the suitable food elements have been absorbed in the small intestine, the residue passes on into the large intestine and is evacuated from the body in the movements of the bowels.

In order to prevent interference with health, we should have at least one bowel movement a day. If the waste material is not removed regularly from the body, the condition known as constipation is produced. Bacteria begin to decompose the retained waste materials, and poisons are formed. When these poisons are absorbed into the blood stream, headache, fatigue, and other disorders result. This condition is known as "auto-intoxication" or "self-intoxication."



One of the most valuable preventions of constipation is to have a regular time for the daily bowel movement, preferably just after breakfast. If the sensations which normally precede the elimination of these wastes are neglected, the habit will be weakened. Likewise, the desire may not recur for so long a time that ill effects from the accumulation of these wastes will appear.

Coarse foods are helpful in preventing constipation. The indigestible parts of vegetables like spinach, celery, cabbage, cauliflower, rhubarb, lettuce, and of many fruits, serve as a stimulant to the muscles in the intestines and aid them in their action. Bran foods, whole grain cereals, and foods containing the "B" vitamins are helpful aids to elimination. Drinking water is important in relieving or preventing constipation. A glass of water taken just after getting up in the morning is especially beneficial. One should drink four or more glasses of water a day in addition to that taken with the meals in order to provide the body with a plentiful supply. Exercise is also essential. Play, games, and other forms of exercise aid in the elimination of body wastes.

The waste products that are formed when fuel is consumed in the tissues, in order to produce bodily heat and energy, are eliminated through the kidneys, lungs, and skin.

The kidneys are well supplied with blood vessels.



### BETTER THAN MEDICINE

*Physical activity helps to keep the body free of poisons resulting from bodily processes*

As the blood passes through them, waste materials are removed, collected in the bladder, and passed out in the urine. The wastes that the kidneys remove become dangerous poisons if not promptly eliminated. It is very helpful to the kidneys to drink plenty of water. Drink water between meals and also with meals, if care is taken not to wash down foods with it. The use the body is making of digested food elements is often tested by analyzing the urine. If the sugar or *fuel* elements are not properly consumed, sugar will appear in the urine where normally it is not found. If protein or

body-building elements are not properly used, "albumen" will appear in the urine as a warning signal that something is wrong.

The lungs provide the means by which the waste carbon dioxide is eliminated from the body. Carbon dioxide is a waste product of combustion and is formed whenever oxygen is used up. It is collected from the tissues by the blood, carried to the lungs, and passed out as a part of the expired air. Vigorous exercise speeds up the changing of air in the air cells and helps the lungs to eliminate their share of body wastes.

The skin is an organ of excretion because the perspiration contains some waste materials. The sweat glands extend down into the inner layer of skin and lie coiled up among the capillaries. As the blood passes through the little capillaries, some water, mineral salts, and organic wastes are removed and passed out in the sweat or perspiration. Perspiration is being eliminated from the body all the time. As a usual thing it disappears or evaporates before it can change into drops. Now and then, in hot weather, or when we work or play very hard, the water collects into drops because it is excreted faster than it can evaporate.

The elimination of waste materials by the skin is important, for as much as two to three pints of perspiration pass out through it each day. We should do all we can to aid the skin in this impor-

tant work. Keep the pores clean so that the moisture can pass out through them. Drink water freely to promote the normal secretion of perspiration.

### RELATED HEALTH HABITS

#### For Individual Check-Up:

1. Breathing:

Breathe plenty of fresh air  
Sleep with the windows open.

2. Care of the Skin:

Get plenty of exercise  
Keep the skin clean.

3. Drink water:

On arising in the morning  
Frequently during the day  
Mostly between meals  
Not too much during meals.

4. Food Values:

Fats and oils act as lubricants in the alimentary canal.  
Bulky foods (roughage) aid in regular elimination.  
Vitamin "B" is thought necessary to regular elimination.

5. Empty the bladder:

On arising in the morning  
Before going out anywhere  
Before retiring  
Whenever else it may be necessary.

6. Elimination from the large intestine:

Obey the warning sensation immediately  
Form the habit of bowel movement at the same time each day.

## XXIII. MENTAL HEALTH

Mental habits have an important effect upon our mental health, just as physical habits connected with exercise, nutrition, rest, and sleep have an important influence upon our physical or body health. The condition of the mind also has an influence upon the body. Cheerfulness is a much healthier state of mind than gloom or depression of the spirits.

In normal life one should be *interested* in the world around him, and curious to understand it. Interest in *persons* leads to the formation of new friends. It provides companionship of one's own age and opens up many opportunities for the fullest development of the personality. Interest in *things* should be varied. In the upper grades and in high schools there are numerous opportunities to try out interests in many different things until some are found that are more permanent and satisfying than others. Hobbies often are the outgrowth of interest in things. Since a hobby is something outside of one's regular work, it gives needed periods of relief and relaxation. Hobbies often cover a wide range of interests.

The ability to *concentrate attention* upon a subject at hand is a valuable asset. It is easiest when interest is strong and the body and brain are not fatigued. When applied to school work, concentra-



tion requires a working knowledge and an application of good study habits.

Happiness and cheerfulness are desirable mental habits. They are important aids in retaining friendships and in the formation of new ones.

Self-confidence is a valuable asset. Learn to face the problem of life squarely. Do not shirk disagreeable tasks or responsibilities just because they are unpleasant. Attack a problem confidently and whole-heartedly. Those who run immediately for help, or try to shift the burden to others, or give up entirely after a half-hearted attempt are forming harmful mental habits. It has been found from experience that persons can run away from problems of life for awhile but sooner or later they meet conditions that cannot be pushed aside. Failures at such times may lead to "mental breakdowns" and other nervous disorders. The problems that are met in the early years of life afford good training for the solution of the problems of life in after years.

Daydreaming is only worth while when it results in something constructive and helps in the development of the individual.

Character is built upon the foundation of good mental habits. The habits of truthfulness, honesty, fair play, thoughtfulness, courage, persistence, and all the others that make up character are developed by practicing high standards on every occasion.



The emotional life should be one of moderation. Extremes should be avoided. Anger and fear and rage have harmful effects upon mental and physical development.

### RELATED HEALTH HABITS

#### For Individual Check-Up:

1. Cultivate cheerfulness.
2. Form desirable friendships.
3. Have a hobby or two.
4. Practice self-control.
5. Concentrate—one thing at a time. Enthusiasm is a great factor in success.
6. Avoid worry:
  - Face facts.
  - Make up your mind.
  - Stick to it.
  - Do not evade issues.
7. Get plenty of rest—mental and physical.
8. Make wise use of leisure time.
9. Avoid emotional extremes.
10. Seek to form a good character—truthfulness, honesty, fair-play, thoughtfulness, courage, persistence, and other traits.
11. Plan the future.
12. Make your plans come true.

## XXIV. CARE OF THE EYES

Sight is one of the most valuable of the "special senses." It is in almost constant use during the waking hours. It deserves especial care.

The amount of light that strikes the eyes should be carefully regulated. It should be neither too bright nor too dim. When reading or writing, it is best to have the light shine over the left shoulder to avoid shadows upon the page from the right hand or arm. Light should never be reflected directly into the eyes from the pages of a book or from any other shiny or highly polished surface.

Long continued use of the eyes often results in eyestrain. The eyes may burn, smart, or feel strained after being used for some time. The eyelids and eyeballs become reddened or inflamed. Frontal headache usually occurs. Temporary relief can sometimes be obtained by resting the muscles of the eye. Look away toward a distant object occasionally to change the focus. Whenever these warning signals of eyestrain or any other unusual symptoms occur, an expert should be consulted at once. If glasses are needed to correct the defects that may be found, they should be worn faithfully according to the directions of the expert who recommended them.

*To Remove a Foreign Body from the Eye:* There



*People who go about without eye glasses in spite of an active need for them are less efficient mentally and physically than those who have their defective vision corrected. Frequently such uncorrected defects gradually become more serious.*

are several methods for removing a foreign body from the eye. Close the eye for a few moments and the tears may wash out the offending particle. If this is not successful, pull the upper lid down over the lower lid and hold it there for a few moments. When the lid is suddenly released, the particle often has been removed. If it still remains, however, get a capable person to examine the surface of the eyeball and inner sides of the lids. Turn the lids back over a toothpick or matchstick so that the foreign body can be wiped off with the folded tip of a clean handkerchief. Do not rub the eye. This may

press the particle into the delicate surface and make its removal more difficult.

### RELATED HEALTH HABITS

#### For Individual Check-Up:

1. Let the light fall over the left shoulder, from the rear.
2. Read or work only in a good light:  
    Not too strong (as a glare)  
    Not too dim (as at twilight)
3. When something gets into your eye, go to some one whom you can trust for help. Avoid rubbing or irritating it.
4. Never touch the eye with your hand. Use a clean handkerchief.
5. Never touch the eye with anything that some one else has used (like a dirty towel, or soiled handkerchief).
6. Hold your book or work neither too close nor too far from the eye.
7. Do not read or write while lying down.
8. When reading, do not sway, rock, or wriggle. (Swings, automobiles, trolley cars, railroad trains, busses, etc.)
9. Rest the eyes when they feel sore or tired.
10. Be careful to avoid eyestrain after an illness.
11. If your eyes hurt you, be sure to go to an oculist.
12. If you are supposed to wear glasses, *wear them.*

## XXV. CARE OF THE EARS

The ears are sensitive and delicate mechanisms. Blows on the ear should be avoided. The ears should never be pulled. Excess wax that collects in the outer ear can be removed by using the rolled up end of a towel or handkerchief. Do not use hard instruments of any kind for this purpose because the eardrum can be easily punctured by them.

Most cases of deafness are connected with an injury or defect of the middle ear. The middle ear is connected with the throat by means of the Eustachian tube. Germs of colds, grippe, or other diseases sometimes extend up this tube and infect the middle ear. Such infection is always a serious condition and should never be neglected.

### RELATED HEALTH HABITS

#### For Individual Check-Up:

1. Do not pull or box the ear.
2. Never permit any foreign substance to get into the ear.
3. Never pick the ear with anything sharp or hard.
4. When swimming, eardrum protectors are good things.
5. Avoid very loud noises.
6. Get rid of a cold as quickly as you can.
7. Always blow the nose gently.
8. For earache or a pain behind the ear:
  - (a) Use warm cloths or a hot water bag to ease the pain.
  - (b) Always consult a physician.

## XXVI. ALCOHOL AND OTHER NARCOTICS

### Habit Forming Character:

The great danger in the use of alcohol, tobacco, and certain patent medicines containing dangerous drugs lies in the fact that the use of them tends to create a desire for more, increasing use causing ever increasing desire. In this respect, alcoholic drinks and tobacco in its various forms fit into the description of the effects of any narcotic drug. It is the vicious circle of ever widening and deepening desire through their use that constitutes the greatest menace to the health of the individual and to the welfare of society.

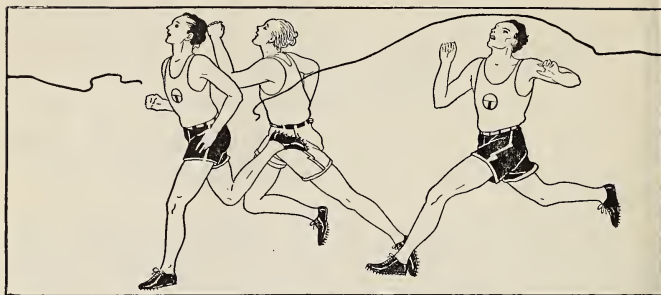
### Alcohol:

Alcohol causes deterioration and loss of control in the nervous system. This is evidenced in the loss of mental and physical balance in the actions of the person under its influence. It also has bad effects on the heart and the blood vessels. It lessens one's efficiency and ability for work. The digestive organs, the liver, and the kidneys are subject to disturbance and injury by its use, and resistance to disease is lowered. Business men will not employ heavy drinkers, and for certain responsible positions a man who drinks cannot be employed.



For these and other reasons previously stated, the use of alcoholic liquors is steadily declining throughout the world, even in countries where there are no laws to restrain it. The heavy drinking that characterized much of American and European life during past centuries is on the decline. The world is growing up!

Some people believe that a nation or a state has no right to pass laws forbidding the use of alcohol, because it interferes with personal liberty. States and nations have the same rights in this respect as they have in dealing with any dangerous habit-forming drug, the use of which may lead to crime, poverty, and social degradation. States and nations have a right to pass laws for the safety, welfare, and happiness of their people. People under the influence of alcohol and other drugs often commit crimes which they would not commit otherwise. Children are frequently raised in poverty and ignorance because of the drunken habits of a father, a mother, or both. Many have suffered from the abuse of the alcoholic drinker. Money that is needed for food, clothing, and education for a family is frequently wasted on liquor. It is for this reason that nations throughout the world have sought to eliminate or modify the alcoholic liquor business. Many people have used alcohol moderately and temperately, but it is also true that of all the drunkards in the world, few, if any, expected or



### THE COLLEGE ATHLETE

*When in training, and generally at all times, does not use either alcoholic drinks or tobacco. Why?*

wished to become such when they first started to indulge. Let it alone. Do not permit yourself to be influenced away from that wise decision.

### **Tobacco:**

Tobacco, too, is a habit-forming narcotic. It contains a deadly drug called nicotine, part of which is absorbed when tobacco is used. The use of tobacco interferes with the heart beat, disturbs the nervous system, reduces physical strength and endurance, and retards normal growth and development in those who have not reached physical maturity. There is evidence that it lessens one's mental efficiency, and in particular interferes with the ability of students to do their best in their studies. This is shown by records and investigations made in

many schools and colleges. It is frequently a handicap in securing employment, is socially offensive to many people, and often has a harmful effect on character. Smoking has caused many fires, resulting in the loss of money and lives. The money invested in the use of tobacco by an individual can be used to greater advantage in other ways. This is particularly important to students who depend upon a parental allowance for money; generally, the allowance seems too small anyway. All the more reason therefore for not wasting any of it on tobacco. Postpone smoking until you are at least 21 years of age. Do not lose sight of the fact that there is an opportunity for character development in making up your mind to do this, and then sticking to it. Never permit yourself to be forced out of a wise decision, let others do what they may.

### **Other Habit Forming Drugs:**

There are certain dangerous habit-forming drugs (like opium, morphine, heroin, and cocaine) that are occasionally used in medicine for deadening pain. The United States government has passed laws against the traffic in such drugs. Reputable physicians are loth to prescribe them because of the danger to the patient of becoming so used to them that he cannot do without them. Their continued use results in great physical harm and degradation of character. The interference of a few for-

eign governments with the efforts of China to restrict the manufacture of the drug opium is one of the most shameful chapters in history, and it has resulted in great moral damage and economic loss thus retarding the proper development of that country. Harmful drugs are often contained in patent medicines, headache powders, sleeping powders, soothing syrups, sedatives, or medicines for the relief of pain. For that reason it is well to avoid their use. The National Pure Foods and Drugs Act of 1906 requires that the different substances used in a patent medicine be printed on the label. This has done much to protect the public from the unsuspecting use of such drugs.

### RELATED HEALTH HABITS

#### For Individual Check-Up:

1. Avoid alcoholic drinks:

Their habit-forming character makes them dangerous.

You never know "the end of the road."

2. Avoid tobacco in any form:

Particularly undesirable for athletes and students.

Wait until maturity.

3. Avoid patent medicines and self-medication:

Consult a physician.

Do not take unknown powders or drugs. Beware of strangers who offer them.

4. Practice self-control:

Endeavor to build up a fine character.

Fine character is in demand everywhere.

## HEALTH! HAPPINESS! SUCCESS!

Try to lead a well balanced life. Do not neglect health in the pursuit of some false ideal of happiness or success. It was Emerson who said that "health is the first wealth."

Avoid excesses. Study your own physical condition and abilities. Do not overtax your strength in too strenuous play or competitive games. When the time for lifework comes, do not forsake the proper kind of relaxation or recreation. Keep yourself in good physical trim. As a general proposition, those who have health and vitality are those who will achieve the most good in life.

Success is not to be measured in terms of money or position alone, but rather in terms of one's happiness and satisfaction in life. Do not "lose" yourself in your job or your work. Take time to enjoy the fine things of life as you go along. Ever continue to balance mental and physical health. The authors wish you "Health! Happiness! Success!"



*The words of Hippocrates:  
"Life is short, art is long,  
experience is difficult"*

# USEFUL INFORMATION

## A

### National Child Health Day

The first of May is generally designated by the President of the United States as National Child Health Day. It is customary in many schools throughout the country to observe this day by appropriate exercises during the regular school sessions. In some cities the regular school work for this day is laid aside or made secondary to health activities and exhibitions of school health work. Listed below are some suggestions for the observance of Health Day. The school program may be changed to include as much as may be desired.

(1) Exhibition of games, dances, and exercises in the school yard, or in a nearby park, or other community center. In some cases several or all the schools of a community may meet at the same time if space affords opportunity. The games, dances, or exercises should be selected to suit the ages of the students, thus, singing games for kindergarten and first grades and competitive team games and advanced exercises for the higher grades.

Many schools have found it advisable to have only students of the same general age or grade in the yard at one time, scheduling other classes or grades to appear when the preceding group



finishes. Thus a continuous program is provided for the whole morning or the whole day. This is particularly necessary where the yard space is limited. Classes may continue regular class work or indoor health activities of some sort while awaiting their turn in the yard. Parents should be invited.

(2) A special assembly may be held in the morning or in the afternoon. Pupils may contribute talks relating to health. Short essays on health may be read. Health songs may be sung. The school doctor (medical inspector), the school nurse, or some other authority may talk on the importance of health or some aspect of child health. Parents should be invited to attend.

(3) The pupils of each class should be examined for physical defects by the teacher, the school nurse, or the school medical inspectors, if this has not already been done. Any defects should be entered on the school records of the child for follow-up purposes, and the parents should be notified and urged to have the defects corrected. In some schools no regular school work is permitted until the physical examination has been made. If the class has been examined previously during the term, this is an appropriate time for consulting the records and checking-up on the correction of defects of individual students. This should be done without embarrassment or publicity to the pupils or their parents. The teacher should familiarize herself with the

names of students having physical defects and insist on their correction. Try to interest underweight children in the importance of proper diet, fresh air, sunshine, exercise, rest, and sleep.

(4) The teacher should take every opportunity to see that students with defective vision are seated near the blackboards or have good light. Some students should have permission automatically to change seats as the necessities of the changing classroom situations or activities may demand. The teacher should be sure that students who are hard of hearing are located in seats near the teacher. She should also check up on the size of the desk of each student, making sure that it is comfortably adjusted, being neither too large nor too small. The student should be able to rest his feet comfortably on the floor.

(5) Special lessons in health instruction should be scheduled during the day, particularly lessons of a character that stress application in the classroom and lend themselves to exhibition work. As an exercise in written English, the various classes may previously have written invitations to their parents asking them to attend the various activities of Health Day in their school.

(6) Other lessons in English lend themselves to health day activities. Poems, paragraphs, and letters to parents may be written about Child Health about Health Day, or about some phase of health

Talks by the pupils on health topics may form the basis of the work in oral English.

(7) In history and geography (the social studies), in science and in other subjects, it may be possible to stress health values in the course of the lesson.

(8) All school agencies should unite to impress pupils and parents with the importance of child health, and health activities should be made paramount in the work of the class on National Child Health Day.

## B

### High School Health Clubs and Organizations

In many junior and senior high schools, clubs and organizations have been formed to deal with problems concerning the health of the students. In some cases committees of existing organizations like the Students' Council or School Senate deal with various aspects of health as it relates to the school. In other cases it may be a separate School Board of Health composed of students. A Sanitation Committee may supervise all activities and practices relating to the proper use of the school washrooms, lunch rooms, toilets, halls, fire escapes, yard, and the immediate neighborhood of the school. Another health committee, a publicity committee, may supervise and carry on health campaigns among the students enlisting support not only for

a cleaner and healthier school, but also for better standards of health among the students themselves. The effective use of bulletin boards, posters, school paper, or monthly magazine, and other means of publicity in the school lies within their scope also. A safety committee may devise ways and means of preventing accidents to the students both within the school and its immediate neighborhood.

Occasionally health work may be made most effective by organizing the hygiene class as a health club. Organization for health purposes frequently leads to better coöperation and gets more effective results. In other schools health clubs may be formed to meet during the regular club period. The name given to the club may indicate a particular purpose, Clean-Up Club, Good Citizenship Club, or a Health Habit Club. If its purpose is general, it may simply be called a Health Club. The members of such a club may keep individual records of their own health habits, and at the end of each month, graphs may be made by each student to indicate his or her progress. Comparison of results will enable members of such a club to tell whether or not he is above or below normal in certain habits, and will indicate the line along which efforts for self-improvement should be made. Discussion for ways and means of correcting defects may well be a part of the work of such a class. As a result of such health club activities, there is evidence

that the students of some high schools have been able to correct many undesirable health habits and to improve the general condition of their health. Members of the Boy Scouts, Girl Scouts, Camp Fire Girls, and similar organizations can assist greatly in any school health program.

## C

### The School Lunch

If your school has a school lunch counter or cafeteria, be sure to use it. There you will get the best foods to keep you strong and healthy.

The following suggestive menus from *Farmers' Bulletin Number 712*, United States Department of Agriculture, Washington, D. C., will prove helpful in planning this important midday meal. This bulletin also contains additional suggestions and recipes for school lunches.

A. Suggested menus for lunches prepared and eaten at home:

1. Eggs, boiled, coddled, poached, or scrambled; bread and butter; spinach or other greens; plain cake.
2. Beef stew with vegetables; crisp, thin tea biscuits; honey.
3. Dried bean or pea or peanut butter purée; toast; baked apple; cookies.
4. Vegetable-milk soup; zwieback; rice with maple sugar and butter, milk or cream.
5. Potato chowder; crackers; jelly sandwiches.

6. Cold meat; creamed potatoes; peas; bread and butter; frozen custard or plain ice cream; plain cake.

7. Lamb chop; baked potatoes; bread and butter; sliced bananas and oranges; cookies.

8. Baked omelet with spinach, kale, or other greens; bread and butter; apple sauce; cake.

9. Milk toast; string beans; stewed dried fruit; cake.

10. Boiled potatoes; codfish gravy; bread and butter; lettuce; custard.

**B. Suggested menus for basket or box lunches prepared at home and eaten in school:**

Sandwiches with sliced tender meat for filling; baked apple; cookies, or a few lumps of sugar.

Slices of meat loaf or bean loaf; sandwiches; stewed fruit; small frosted cake.

Crisp rolls, hollowed out and filled with chopped meat or fish, moistened and seasoned, or mixed with salad dressing; orange, apple, a mixture of sliced fruits, or berries; cake.

Lettuce or celery sandwiches; cup custard; jelly sandwiches.

Cottage cheese sandwiches, or a pot of cream cheese with bread-and-butter sandwiches; peanut sandwiches; fruit; cake.

Hard-boiled eggs; baking powder biscuits; celery or radishes; brown sugar or maple sugar sandwiches.

Bottle of milk; thin corn bread and butter; dates; apple.

Raisin or nut bread with butter; cheese; orange; maple sugar.

Baked bean and lettuce sandwiches; apple sauce; sweet chocolate.



C. Suggested menus for school lunches, prepared and eaten in school:

1. Vegetable-milk soup; crackers; rolls; fruit; plain cake.
2. Meat and vegetable stew; bread and butter; sweet chocolate.
3. Boiled custard; lettuce sandwiches; fruit; cookies.
4. Dried codfish chowder; crackers; fruit; maple sugar or jelly sandwiches.

## D

### **The School Doctor and the School Nurse**

Many schools, especially those in cities, have school doctors and school nurses to help the students and to make friendly suggestions to improve their health.

Remember, they are your good friends—they are trying to help you.

Generally they give a medical examination to each student at least once a year. If they find any condition that needs correction, it should be attended to as soon as possible.

## FOOD ELEMENTS IN SOME OF THE COMMON ARTICLES OF DIET

NAME OF FOOD	PROPORTION OR PER CENT OF				VITAMINS			
	Protein	Carbo- hydrate	Fat	Water	Mineral Content	Vitamin A	Vitamin B	Vitamin C
<b>Fruits:</b>								
Apples, raw, fresh.....	0.3	14.9	0.4	84.1	0.3	+	+	++
Bananas, raw, fresh.....	1.2	23.0	.2	74.8	.8	+ to ++	+	++
Lemons, fresh.....	.9	8.7	.6	89.3	.5	++	++	++
Oranges.....	.9	11.2	.2	87.2	.5	++	++	++
Peaches.....	.5	12.0	.1	86.9	.5	+ to ++	+	++
Pineapples, raw, fresh.....	.4	13.7	.2	85.3	.4	++	++	++
Pineapples, canned.....	....	....	....	....	....	++	++	++
Prunes, fresh.....	.9	21.8	.2	76.5	.6	++	+	++
Strawberries.....	.8	8.1	.6	90.0	.5	+	+	++
<b>Vegetables:</b>								
Asparagus, green.....	1.8	3.3	.2	94.0	.7	++	++	•
Beans, dried.....	22.5	59.6	1.8	12.6	3.5	++	++	•
Beans, string, fresh.....	2.3	7.4	.3	89.2	.8	++	+	+
Beets, root.....	1.6	9.7	.1	87.5	1.1	- to +	+	++
Cabbage, green, fresh.....	1.6	5.6	.3	91.5	1.0	++	++	+
Cabbage, cooked.....	....	....	....	....	....	+	++	+
Cauliflower, fresh.....	1.8	4.7	.5	92.3	.7	+	+	+
Cauliflower, boiled.....	....	....	....	....	....	+	+	+
Celery stalks, bleached.....	1.1	3.3	.1	94.5	1.0	- to ++	++	•
Lettuce, head.....	1.2	2.9	.3	94.7	.9	+ to ++	++	+
Onions, raw.....	1.6	9.9	.3	87.6	.6	- to +	+	++
Onions, cooked.....	1.2	4.9	1.8	91.2	.9	- to +	+	+
Peas, fresh, home-cooked.....	7.0	16.9	.5	74.6	1.0	++	+	++
Peas, canned.....	....	....	....	....	....	++	+	++
Potatoes, white, boiled 15 min.....	2.5	20.9	.1	75.5	1.0	+	++	+
Potatoes, white, boiled 1 hr.....	....	....	....	....	....	+	++	+
Spinach, fresh, raw.....	2.1	3.2	.3	92.3	2.1	++	++	+
Spinach, home-cooked.....	2.1	2.6	4.1	89.8	1.4	++	+	+
Tomatoes, raw.....	.9	3.9	.4	94.3	.5	++	++	+
Tomatoes, canned.....	....	....	....	....	....	++	++	+
<b>Eggs, Fish, Meat, Dairy Products:</b>								
Eggs, whole, fresh.....	13.4	.0	10.5	73.7	1.0	++	+	•
Fish, fat, like salmon.....	15.3	.0	8.9	74.9	.9	+	+	•
Fish, lean, like cod.....	16.5	.0	.4	82.6	1.2	- to +	+	•
Oysters.....	6.2	3.7	1.2	86.9	2.0	++	++	+
Liver.....	....	....	....	....	....	++	++	+
Meat, lean, beef.....	19.3	.0	13.6	67.0	.95	++	+	- to +

NAME OF FOOD	PROPORTION OR PER CENT OF					VITAMINS		
	Protein	Carbo- hydrate	Fat	Water	Mineral Content	Vitamin A	Vitamin B	Vitamin C
<b>Eggs, Fish, Meat, Dairy Products:</b>								
Meat, lean, poultry.....	19.3	.0	16.3	63.7	1.0	- to +	+	*
Milk cows whole, fresh.....	3.3	5.0	4.0	87.0	.7	++	++	++
Milk, condensed (sweetened).....	8.8	54.1	8.3	26.9	1.9	++	++	- to ++
Milk, evaporated.....	9.6	11.2	9.3	68.2	1.7	++	++	- to ++
Milk, skim, fresh.....	3.4	5.1	.3	90.5	.7	++	++	- to ++
Buttermilk.....	3.0	4.8	.5	91.0	.7	++	*	*
Cheese.....	25.9	2.4	33.7	34.2	3.8	++		
<b>Cereals, Flour, and Flour Products:</b>								
Bread, white (milk).....	9.6	51.1	1.4	36.5	1.4	++	++	- to +
Corn, whole (white).....	.....	.....	.....	.....	.....	++	++	-
Corn, whole (yellow).....	.....	.....	.....	.....	.....	++	++	-
Oats.....	.....	.....	.....	.....	.....	- to +	++	-
Rice, polished.....	.....	.....	.....	.....	.....	+	++	-
Rice, whole.....	.....	.....	.....	.....	.....	+	++	-
Wheat, whole.....	10.8	74.8	1.1	12.8	.5	+	+	-
Wheat, flour, white.....	13.8	71.9	1.9	11.4	1.0	+	++	-
Wheat, flour, whole.....	.....	.....	.....	.....	.....	+	++	-
<b>Sugars:</b>								
Honey.....	.4	81.2	.0	18.2	.2	-	+	-
Molasses.....	2.4	69.3	.0	25.1	3.2	-	+	-
Sugar, granulated.....	.0	100.0	.0	.0	.0	-	+	-
<b>Fats, Oils, Nuts:</b>								
Butter.....	1.0	.0	85.0	11.0	3.0	++	++	*
Cream.....	2.5	4.5	18.5	74.0	.5	++	++	- to +
Cod Liver Oil.....	.....	.....	.....	.....	.....	++	+	-
Lard, refined.....	.0	.0	100.0	.0	.0	++	-	*
Brazil Nuts.....	17.0	7.0	66.8	5.3	3.9	++	++	*
Cocoanut.....	5.7	27.9	50.6	14.1	1.7	++	++	*
Peanuts.....	25.8	24.4	38.6	9.2	2.0	++	++	*
Walnuts, English.....	16.6	16.1	63.4	2.5	1.4	++	++	*
<b>Miscellaneous:</b>								
Yeast.....	11.7	21.0	.4	65.1	1.8	- to +	++ to ++	-

In the lists of Vitamins, the signs used have the following meaning: + indicates that the food contains the vitamin; ++ indicates that the food contains no appreciable amount of the vitamin; \* indicates that evidence is lacking, or appears insufficient.

Per cent of Food Elements from United States Department of Agriculture Publications as follows: Fruits from Circular No. 50, Chatfield, and McLaughlin: "Proximate Composition of Fresh Fruits," 1928. Meat, lean, beef, from Department Circular No. 389, Chatfield: "Proximate Composition of Beef," 1926. All others from Bulletin No. 28, revised, Atwater and Bryant: "The Chemical Composition of American Food Materials," 1906. Vitamins from United States Department of Agriculture, Circular No. 84, Smith: "Vitamins in Food Materials," 1929.

## F

**An Inexpensive Quart of Tooth Powder**

"If you secure a clean, dry Mason jar, quart size, nearly any druggist will put up the following formula for a tooth powder, at little cost. Do not use it immediately but shake it thoroughly, now and then, for the first twenty-four hours. This will mix the powders and permit the oils to have sufficient time to permeate all of the ingredients.

"When using, place some of the powder in a small, wide mouth bottle and then shake some of the powder onto the tooth brush that has previously been thoroughly wet. Keep the bottle and the Mason jar tightly closed.

*"Formula for Tooth Powder"*

Finest grade English precipitated chalk.....	1½ pound
Powdered Castile soap.....	1¾ ounces
Light carbonate of magnesia.....	1/3 ounce
Oil of clove .....	46 drops
Oil of wintergreen .....	35 drops
Oil of sassafras .....	35 drops
Oil of peppermint .....	18 drops
Saccharine—finely powdered.....	4 grs."

Adapted from directions on Care of the Teeth, issued by City Board of Health, Bridgeport, Connecticut.

## G

**How to Make Lime Water**

(For use as a tooth wash)

Five cents worth of coarse, unslaked lime, such

as the masons use for coarse plaster, will keep a whole family supplied with the best kind of a mouth wash for a whole year. The refined lime that the druggist sells does not seem to have the same solvent action. Perhaps the refining process robs it of some of its virtues.

Secure from a paint store a lump of coarse lime and crush it into a fine powder. Place a half cupful into an empty quart bottle and fill nearly full with cold water. Thoroughly shake and then allow the lime to settle to the bottom of the bottle, which will take several hours. After it has settled pour down the sink as much of the clear water as you can without losing any of the lime, as this first mixing contains the washing of the lime. Again fill with cold water, shake well, and allow it again to settle.

Into an empty twelve ounce bottle pour the clear lime water, taking care not to stir up the lime in the bottom of the bottle; now place the quart bottle under the faucet and fill with cold water, shake thoroughly, and set it aside to use when the smaller bottle becomes empty. This process may be repeated until the half cup of lime has made five or six quarts of mouth wash.

The twelve ounce bottle is used since it is more easily handled at the wash bowl. After brushing and flossing the teeth, pour out a little of the lime water into a glass, and taking it into the mouth, force it back and forth between the teeth with the

tongue and cheeks until it foams. If you rinse it long enough to make it foam it has then been in the mouth long enough to have a beneficial action on the teeth. After spitting it out, rinse the mouth with clear water to take away the taste of the lime. If the lime water is a little strong at first, dilute it with clear water in the small bottle, half and half. It should be used clear and full strength as soon as the gums become hard and healthy from brushing.

Extract from directions on Care of the Teeth, issued by City Board of Health, Bridgeport, Connecticut.

## H

### Self-Testing Health Scale

A number of self-testing scales have been devised. The one presented below is simply constructed but rather complete in the health practices that are included.

It is a good practice to have a thorough physical examination by a competent physician at least once every year.

#### Self-Testing Scale

Give yourself 5 points for every item which you do. Add the scores and see if you can make a grade of 100.

1. I brush my teeth every morning and night.
2. I eat fruit every day.
3. I eat a cereal at breakfast.
4. I drink at least one glass of milk every day.
5. I drink several glasses of water every day. .



6. I eat at least one "top-of-the-ground" vegetable every day.
7. I chew my food well.
8. I do not drink tea or coffee.
9. I do not drink from a glass anyone else uses.
10. I do not eat candy just before my meals.
11. I guard against constipation by going to the bathroom early every morning.
12. I try to maintain good posture.
13. I try to keep pencils, pens, and my fingers out of my mouth.
14. I try to keep my hands and nails clean.
15. I wash my hands before eating.
16. I take a complete bath at least once a week.
17. I play out of doors every day.
18. I sleep at least 8 hours every night.
19. I sleep with my bedroom windows open.
20. I always have a handkerchief with me.

TOTAL.....

## I

### Communicable Diseases

#### Quarantine Rules and Regulations

NOTE: The following rules and regulations for the control of contagious diseases appear in pamphlet form, and are in force in the public schools of Atlantic City, New Jersey. They are used by permission. They are in accord with the laws of that state. Since they are based on sound authority and common practice of the medical profession, they are included here not only for the

information of teachers, students, and parents but also for possible use of local school authorities who may desire to use such material, and to save the expense of a printed individual pamphlet.

### Definitions

*Immune*—A person not susceptible to some particular disease.

*Non-Immune*—A person who is susceptible to some disease.

*Contact*—A person who has been in the same room or dwelling occupied by another person having a communicable disease.

*Positive Culture*—A substance like gelatine showing the development of bacteria germs.

*Schick Test*—A skin test used to determine immunity from or susceptibility to the disease, Diphtheria.

*Incubation Period*—The length of time exposure to a disease that it takes the germs to grow in number sufficient to cause signs and symptoms of sickness.

*Contagious Disease*—A contagious disease implies direct or personal contact.

*Infectious Disease*—An infectious disease is usually considered as one not conveyed by contact but through some hidden influence or medium such as a germ.

Rosenau states that "The distinctions between the words contagious and infectious are entirely artificial as so called infectious diseases may be contagious and contagious diseases infectious."

*Note*—United States Public Health Service and many State Boards of Health use the term *Communicable Diseases* for both contagious and infectious diseases.

### Quarantine

*Medical Definition*—The enforced isolation of any person or place infected with contagious disease.

*School Definition*—The enforced isolation or absence from school of any pupil or teacher because of contact with a person having communicable disease.

*Carrier*—A person who is harboring disease germs, but who, nevertheless, shows no signs or symptoms of the disease.

*Note*—Medical Inspectors are not permitted to treat injuries or disease as a part of their school work. It is understood that Medical Inspectors and Nurses shall give First-Aid Treatment when ever they are called upon to do so by either teachers or principals.

*Suspicious Cases*—Should be isolated until passed upon by medical authority.

### Chicken Pox

*Definition*—It is an acute contagious disease marked by a slight fever, and a discrete water-blister like rash.

*Principal Early Signs and Symptoms*—Gradual onset. A mild fever may or may not be present. The rash appears about the second day; later scabs form. The rash may come in successive crops up to the tenth day.

*Method of Infection*—Droplet infection from nose and throat secretions.

*Incubation Period*—Fourteen to twenty-one days.

*Exclusion*—The patient should be excluded at once as the disease is very contagious. One attack usually protects from subsequent attacks.

*Home Contacts*—

A. Non-Immunes. Not excluded.

B. Immunes. Not excluded.

*Duration of Exclusion—Patient*—The patient may be readmitted after 12 days if there are no scabs present.

*Who Readmits to School?*—Medical Inspector.

*Remarks*—Teachers should refer all suspicious cases to the Medical Inspector. The school nurse should inspect the heads of returning pupils for overlooked scabs and scales.

## Diphtheria

*Definition*—An acute contagious disease caused by the Klebs-Loeffler or K. L. bacillus. It is characterized by a moderate fever, anemia, great prostration, and the formation of a membrane on the surface of the throat and adjacent parts.

*Principal Early Signs and Symptoms*—Sore throat, with grayish white patches on the membranes of the throat, palate, or tonsils. Chilliness. The glands of the neck about the angle of the jaw may be enlarged and painful.

*Method of Infection*—

A. Discharges sprayed by the coughing and sneezing and spitting of patients. The germs may be carried by an infected person or by recently infected articles.

B. *Carriers*—Persons who are harboring disease germs, but who, nevertheless, show no signs or symptoms of the disease.

*Incubation Period*—From one-half to three days. The disease is usually rapid in onset.

*Exclusion—Patient*—Exclude child at once. The physician should notify City Health Officer.

*Home Contacts*—

A. *Non-Immunes*—Exclude all pupils in same house. If they change residence, they may return at end of 7 days if no symptoms develop.

B. *Immunes*—May remain in school if they have a state-

ment from the Board of Health covering "negative" Schick test or evidence of having had toxin-antitoxin immunity.

*Duration of Exclusion—Patient and Contacts*—Such pupils and teachers may not return until they present evidence of a negative culture or a permit to readmit from the Health Officer.

*Who Readmits to School?*—City Health Officer.

*Remarks*—In case of an outbreak of Diphtheria there should be a rapid examination of all pupils. Schick tests and the use of toxin-antitoxin is advisable for all positive or susceptible pupils. One attack of the disease does not convey protection from subsequent attacks.

At the time of an epidemic, every sore throat should be carefully examined by the Medical Inspector.

### Measles

*Definition*—An acute contagious disease, characterized by a catarrh of the nose and throat, moderate fever, and a red papular rash.

*Principal Early Signs and Symptoms*—It begins like a cold in the head, with mild fever, running nose, watery, inflamed eyes, and sneezing. The rash appears about the third or fourth day and consists of small, irregular groups of dull-red slightly raised spots. These are usually first seen on the forehead and face, and they rapidly spread over the entire body. The rash may almost disappear if the patient becomes chilled, but reappears when he becomes warm again. The rash lasts four or five days and is followed by a bran-like desquamation.

*Method of Infection*—Discharges sprayed or thrown from mouth or nose in coughing, sneezing, or spitting.

*Incubation Period*—Seven days to two weeks.

*Exclusion—Patient*—Exclude at once. Physicians should notify the City Health Officer.

*Home contacts—*

A. *Non-Immunes*—Well children in the family who *have not had measles* are to be excluded.

B. *Immunes*—Children who *have had measles* may attend school provided they present a statement to that effect signed by a physician.

*Duration of Exclusion—Patient*—May return 7 days after the disappearance of all rash and evidence of discharges.

*Non-Immunes—"Contacts."*

Well children in family who have not had measles may return to school after 14 days from date of last exposure, provided they take up residence in another home and no symptoms have developed.

*Who Readmits to School?*—Health Officer or Medical Inspector.

*Remarks*—Measles is infectious even before the rash occurs. It is a serious disease in children because of its after-effect such as broncho-pneumonia and even tuberculosis. Inflammation of the middle ear and weak eyes often result from an attack of measles.

## Mumps

*Definition*—An acute contagious disease, characterized by inflammation of the parotid and other salivary glands.

*Principal Early Signs and Symptoms*—The onset is either sudden or gradual. Chill and moderate fever. Swelling in front of the ear. Pain when biting hard or opening the mouth very wide.

*Method of Infection*—Discharges sprayed or thrown from mouth or nose in coughing, sneezing, or spitting.

*Incubation Period*—Ten days to three weeks.

*Exclusion—Patient*—Exclude child at once.



*Home Contacts—*

A. Non-Immunes. No quarantine.

B. Immunes. No quarantine.

*Duration of Exclusion—Patient—*May return after fourteen days, if there are no symptoms and if the jaw swelling has disappeared.

*Who Readmits to School?—*Medical Inspector.

*Remarks—*Mumps is very infectious. Early diagnosis is important. Defective hearing may be a serious after-effect.

### Scarlet Fever

*Definition—*An acute contagious disease. High fever. Rapid pulse. Sore throat. Scarlet rash.

*Principal Early Signs and Symptoms—*Rapid onset. Vomiting. Sore throat. Headache. Fever. The rash usually appears within 24 hours and is first seen on the neck and upper chest. Early in the disease, the tongue is white in color with bright red spots resembling a "strawberry."

*Method of Infection—*Discharges sprayed or thrown from the mouth or nose in coughing, sneezing, or spitting. (Discharges from the ears of patients may be infectious.)

The germs may be carried by an uninfected person or by recently infected articles.

*Incubation Period—*One to seven days.

*Exclusion—Patient—*Exclude child at once. The physician should notify the City Health Officer.

*Home Contacts—*

A. Non-Immunes. Yes.

B. Immunes. Yes, unless admitted by Health Officer.

*Duration of Exclusion—Patient—*Exclude child for a minimum of thirty days. (All discharges from nose, throat, or ears must have cleared.)

*Contact—Non-Immunes—*Exclude pupils from same home unless they change residence. If they change residence ex-

clude for 7 days and then readmit if there have been no symptoms of disease and if the pupils do not return to the infected home.

*Who Readmits to School?*—City Health Officer.

*Remarks*—Scarlet Fever is dangerous, both during and after the attack because of the possible after-effects. Slight attacks are as infectious as severe ones.

When Scarlet Fever is occurring in a school, all pupils with sore throats should be isolated from the classroom until seen by the Medical Inspector.

### Smallpox

*Definition*—An acute infectious disease characterized by a sudden onset and an eruption passing through stages from macule to crust or scab.

*Principal Early Signs and Symptoms*—Sudden onset. Vomiting and high fever with headache or backache. Marked prostration. Rash first appears about the face and wrists.

*Method of Infection*—All discharges from nose, mouth, sores, and scabs convey infection. Smallpox germs may be carried by an uninfected person or by recently infected articles.

*Incubation Period*—Ten days to two weeks.

*Exclusion—Patient*—Exclude at once. Physicians should notify the City Health Officer.

*Home Contacts*—

A. *Non-Immunes*—Exclude other children from same home. If there is a change of residence, exclude for 14 days and then readmit if there have been no symptoms of the disease and if the children do not return to the infected home.

B. *Immunes*—Pupils who have been successfully vac-

inated need not be excluded provided there is a change of residence.

*Duration of Exclusion—Patient*—Until all crusts and scales have fallen off.

*Contacts—Non-Immunes*—Twenty days provided there is a change of residence and no symptoms. Same as patient if there is no change of residence.

*Who Readmits to School?*—City Health Officer.

*Remarks*—Smallpox is particularly infectious. Successful vaccination or evidence that children have been vaccinated at least twice without “takes” are required.

Vaccination is a well-nigh perfect preventive.

### Whooping Cough

*Definition*—An infectious disease, characterized by catarrh of the respiratory tract and peculiar paroxysms of cough ending in a prolonged whooping inspiration.

*Principal Early Signs and Symptoms*—Early symptoms resemble those of a cold in the head. Later there is a persistent cough which grows worse at night. The characteristic “whoop” does not develop for a week or more after the onset of the disease.

*Methods of Infection*—Discharges sprayed or thrown from mouth or nose in coughing, sneezing, or spitting.

*Incubation Period*—Seven to ten days.

*Exclusion—Patient*—Exclude at once.

*Home Contacts*—

A. Non-Immunes. No quarantine.

B. Immunes. No quarantine.

*Duration of Exclusion*—Exclude child with disease until the “whoop” ceases—usually a period of six weeks.

*Who Readmits to School?*—School Medical Inspector.

*Remarks*—Whooping Cough is especially contagious in

the early stages. It is frequently fatal in infancy. Second attacks are rare.

### **Influenza or La Grippe**

*Definition*—An acute infectious and contagious disease characterized by fever, marked prostration, severe muscular pains, and catarrh of the respiratory and intestinal tracts.

*Principal Early Signs and Symptoms*—Abrupt onset, beginning with feverishness, pain in the head, back, and limbs. Usually cold in the head. Chills. Lassitude and prostration.

*Method of Infection*—Discharges sprayed or thrown from mouth or nose in coughing, sneezing, and spitting.

*Exclusion—Patient*—Yes.

*Home Contacts*—

A. Non-Immunes. No quarantine.

B. Immunes. No quarantine.

*Duration of Exclusion*—Until catarrhal symptoms have ceased.

*Who Readmits to School?*—Medical Inspector.

*Remarks*—Influenza is excessively infectious. After-effects may be serious. These include pneumonia, bronchitis, and tuberculosis.

### **Scabies or Itch**

An infectious eruption found most frequently on palm of hand and between fingers. The usual treatment is to wash affected parts thoroughly with warm water and soap and then anoint with a diluted sulphur ointment. Child should be kept separate until cured. Sleep alone. All clothing and bed linen should be boiled for one-half hour. Quite contagious, especially to others in same family. Exclude child until eruption has entirely disappeared.

### **Pediculosis or Head Lice**

Light gray insects. Lay eggs or "nits" in the hair at the

nape of the neck and about ears. Symptoms are irritation and itching of the scalp. The usual treatment is to soak hair in kerosene or in turpentine, wash thoroughly with soap and hot water. Repeat three successive nights. Scrupulous care and cleanliness are sufficient to prevent recurrence. Contagious. Exclude child until head is free from lice.

### Ringworm of the Skin

Begins as a small, reddish, scaly patch about pea size. Gradually increases in size until it may reach that of a silver dollar. Meanwhile central (oldest) part recovers and a characteristic ringlike appearance results. Located on face, wrists, neck, or hands.

The type of ringworm that appears between the toes is popularly known as "athlete's foot." It is associated with dampness and the use of unsanitary shower baths and swimming pools. The usual treatment is to apply tincture of iodine. Mildly contagious. Exclude child until skin is healed.

### Impetigo "Contagious Sore"

Sores which soon form loose scales. Appear on face. The usual treatment is to apply some antiseptic ointment. Child should use separate towels. Very contagious, especially in the spring of the year. Exclude child until sores have disappeared.

## J

Parents are responsible for sending their children to school in good physical condition, with sound health habits already established, and with all

physical defects recognized and undergoing correction.

The schools are responsible for promoting good health in the pupils by providing clean, light, well ventilated classrooms and for arranging a school day which provides ample opportunity for play and game activity.

This information has been prepared with the idea of setting forth in simple and concise form elementary facts relative to common deviations from good health, in order that early recognition of same may provide opportunity for correction. While it was intended primarily for parents of the "pre-school" child, it applies as well to the health of the child in school and with few, if any, exceptions, the health practices recommended on the following pages might be practiced with benefit by adults.

The material on the following pages has been taken from a pamphlet prepared by one of the co-authors of this book, Dr. Maroney, during the time he acted as Director of Health Education in the Atlantic City Public Schools. It was distributed to parents. It is used with permission. School Districts not in a position to distribute individual pamphlets to each parent, may with profit have this information *read by the parent* as a "pupil assignment." Some of this information is duplicated elsewhere in the book, but as the book is for the pupil and this material is for the parent it was



deemed not wise to omit any essential information.

## Information for Parents

### Aims of the Health Education Movement

The National Education Association adopted the following as the aims of the Health Education Movement at its meeting held in July, 1924:

1. To instruct children and youth so that they may conserve and improve their own health.

2. To establish in them the habits and principles of living, which, throughout their school life and in later years, will assure that abundant vigor and vitality which provide the basis for the greatest possible happiness and service in personal, family, and community life.

3. To influence parents and other adults through the Health Education Program for children; to better habits and attitudes, so that the school may become an effective agency for the promotion of the social aspects of Health Education in the family and community as well as in the school itself.

4. To improve the individual and community life of the future; to insure a better second generation and a still better third generation, a healthier and fitter nation and race.

### Smallpox and Vaccination

Smallpox is an acute contagious disease. It is a loathsome disease. In the Middle Ages it was estimated that it carried off one-thirteenth to one-fourteenth of each generation. It is a rare disease nowadays. We seldom see cases of it in an up-to-date community. Why?

The physicians and health workers believe it is because of the great numbers who are vaccinated against the disease.

Those who oppose vaccination claim that it is because of the high standards of personal and community health as compared with the peoples and conditions in the world of a century or two ago.

The United States Government in its Army and Navy, enforces vaccination requirements. The American Medical Association, The Child Hygiene Association, the life insurance companies, and all agencies interested in public health strongly urge that school pupils be vaccinated against smallpox.

The laws of many states permit or compel local boards to enforce the vaccination law. Pupils in all Public Schools should be vaccinated not only for their own protection but for the protection of other children.

Have your child vaccinated *before* he comes to school.

### Diphtheria

*Diphtheria* is a dread disease. It reaches its maximum prevalence in the Autumn of the year. It is preventable. The death rate in Diphtheria has been greatly lowered since 1894, owing to the use of antitoxins and to refinements in diagnosis.

The *Schick Test* will show whether a child or adult is susceptible to Diphtheria. The test consists of injecting about three drops of a test liquid into the skin of the arm. If the child being tested is susceptible, a red spot will develop on the arm. If the child has a natural protection to the disease, no spot will appear.

All persons giving a positive reaction, i. e., showing a red spot after testing, should be protected against Diphtheria. This can be done by giving three injections of the toxin-anti-toxin mixture at stated intervals.

Thousands of public school children and scores of teach-

ers have taken the treatment with highly satisfactory results.

We urge that you have your child protected before he comes to school. Your family physician is prepared to give him the treatment.

### The Eyes

Everyone acknowledges the importance of good eyesight. Many consider the eyes as a general index to health.

It is conservatively estimated that twenty per cent of all children are in need of corrective treatment for eye defects.

It has been demonstrated that there is a progressive increase in eye defects with grade progress in schools.

Parents should recognize the early symptoms of eye-strain such as:

1. A sense of discomfort.
2. Frontal or forehead headache particularly after the eyes have been used for some time in reading, writing, sewing, or other close work.
3. Difficulty in reading on account of letters "running together."
4. A twitching of the eye lids.
5. Red and congested eyes.
6. The appearance of styas.

Some harmful influences on eyesight are:

1. Imperfect lighting, poor light and rays of light that strike glazed paper or highly polished desks that are often reflected into the eyes.
2. Seats too low or too high.
3. Foul air, poor ventilation.
4. Poor paper, poor print, small print.
5. Long hours on concentration.
6. Trolley, train, or auto reading.
7. Using the eyes when one is physically tired.

8. Reading in a lying-down position.

Children should be taught to:

1. Avoid the direct glare of sunlight.
  2. Avoid strong electric or gas light.
  3. Read only such books as are printed with large type.
  4. Play with large toys and avoid all apparatus that necessitates fine eye muscle adjustments.
  5. Use their own handkerchiefs and towels.
  6. Keep away from children with sore, weak, running eyes.
- Parents should:

1. See that their children's eyes are examined by a competent physician at least once a year.
2. Insist that the children are given sufficient out-of-door exercise in plays and games.
3. Be watchful for early deviations from normal health.
4. Set an example of care and attention to the accepted principles underlying good eye hygiene care.

### The Ears

The ears are subject to frost bite, skin disease, (injuries that do not affect hearing) and infections that may travel from the mouth to the throat then to the middle ear. The eardrum may be injured or even ruptured by the very foolish practice of using twigs, toothpicks, pencils, and even hair pins to remove wax or insects that may get into the ears.

A healthy ear should never show more wax than is enough to keep it sticky. Any ear discharge calls for a physician. Parents should note any signs of or tendency to deafness such as apparent inattention, frequent failure to understand spoken directions, or turning the head and body toward the speaker. They should also see that their children have an ear examination every year.

### The Teeth

The temporary or milk teeth are twenty in number. They should be brushed after every meal, cared for by a dentist when necessary, and exercised regularly by having the child chew coarse wholesome food.

The permanent or second set of teeth are thirty-two in number. They are used in biting, tearing and chewing food. They give expression to the face, add to our personal appearance, and are necessary in the clear enunciation of our speech.

It is highly important that we take care of the permanent teeth, clean them regularly and avoid the things that injure them.

### TOOTH STRUCTURE

Each tooth is composed of a "crown" or body which extends or projects above the gum, a root which is embedded in the jaw, and a "neck" which connects crown and root.

The outer covering of the tooth is called enamel. It is a very hard protective substance. The blood supply and the nerve of the tooth are in the pulp substance. Therefore, it is necessary for the surface of the enamel to be broken by physical or germ action and a good deal of decay to take place before a tooth aches.

### CAUSES OF DECAY

1. Continued use of soft foods.
2. Tartar (uncleanliness).
3. Mechanical defects, for example teeth not meeting properly.
4. Acid mouths and germ action.
5. Fragments of food remaining in the mouth after eating, thereby favoring germ action.
6. Deficiency of lime in the diet.

### Preservation of the Teeth

1. Have the teeth of your child examined at least once each year by a competent dentist so that early defects and decay will be recognized and treated. This practice will preserve the teeth, avoid aches and pain, and impress upon old and young alike the importance of dental care.

2. Children should eat foods rich in lime substances. The bones of the body need lime. So do the teeth. The following foods are recommended: milk, butter, cheese, ice cream, and all vegetables that grow above the ground such as lettuce, celery, spinach, carrots, etc.

3. Provide some coarse foods. This favors a good blood supply to the gums and indirectly to the teeth.

4. Make adequate provision for cleaning the teeth regularly—a good brush, a recognized dental paste or powder, and other accessories.

5. Children should be taught to avoid very hot and very cold foods. They should also be taught not to use their teeth to bite thread, nuts, or other hard objects.

6. Parents owe it to their children to set good examples in having regular examinations. They should also provide proper food material, impart instruction in the care of the teeth, and insist that the children clean their teeth regularly.

### Tonsils

The tonsils, two in number, are situated in the rear of the throat, one on each side. They are made of gland-like tissue. In some children they are large and prominent, in others they are small and inconspicuous. They are thought to act as barriers to germs that enter the body through the mouth.

Large tonsils are not necessarily harmful in themselves but tonsils either large or small that become distinctly enlarged from an inflammation process are dangerous and



should have a physician's care. The enlargement may interfere with proper breathing and assimilation of food besides causing discomfort and, at times, pain.

An acute inflammation of the tonsils is known as tonsillitis. This is a serious disease. It should be treated by a physician. It may lead to rheumatism, joint troubles, and heart disease. Tonsils that are chronically enlarged or diseased should be removed by operation.

The most common predisposing or exciting cause of tonsillitis is wet feet. Exposure of any kind seems to favor an attack. Some authorities claim that heredity plays a part in the occurrence of tonsillitis. The disease occurs most frequently between the tenth and fifteenth years. It is primarily a disease of the fall, winter, and spring months. One attack seems to predispose to other attacks. Lowered vitality from overwork, poor and insufficient foods, loss of sleep, bad air, and worry all favor an attack of tonsillitis.

Parents should not minimize the importance of a "sore throat." Every sore throat that causes a fever, loss of appetite, pain, and weakness calls for a physician. It may be tonsillitis, scarlet fever, or diphtheria. It is a serious condition and should be given the benefit of a physician's treatment.

### Adenoids

Adenoids are cauliflower-like growths located behind the nasal passages high up in the pharynx or throat box. They cannot be seen except with the use of throat mirrors and reflected light. Their function is not known. It is believed that they occur in all children. As a rule the tissue shrivels up and disappears at puberty (the age when boys and girls grow into young men and women).

It is not known why the adenoids should become enlarged in some children and not in others. It is known, however,

that enlarged adenoids, if permitted to persist, will interfere with hearing, will impair the proper assimilation of food, and in most cases will disarrange the normal line of the upper teeth causing them to protrude. Enlarged adenoids indicate their presence by restlessness, inability to concentrate in studies, a history of night horrors or nightmares, and evidence of mouth breathing with a decided nasal voice.

The physical malformations caused by adenoids will persist even after operative relief. Therefore, the adenoids should be removed as soon as their presence is recognized. Adenoids are somewhat more common in boys than in girls. They are so frequently associated with enlarged tonsils that it is advisable to remove them as part of all tonsil operations.

### Common Colds\*

Common colds frequently attack the strong and robust.

More people suffer from common colds than from any other single ailment. The discomfort, inconvenience, and the other diseases that may follow common colds all cause serious economic loss.

Colds are caused by disease germs infecting the nose, throat, and air passages. The factors that lead to or favor the occurrence of common colds are:

1. Exposure to hot and cold drafts.
2. Wet feet.
3. Poorly ventilated rooms.
4. Fatigue, either mental or physical.
5. Insufficient or unsuitable food.
6. Adenoid growths.

It is important that a common cold be treated and cared

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\*See also pages 407-414.

for as a real disease. A severe cold calls for a physician's treatment.

Colds in growing children should not be neglected or minimized.

Parents should:

1. Dress their children warmly and change the amount of clothing as the weather indicates.
2. Insist upon a change of stockings and shoes immediately after wet exposure.
3. Treat the child in the beginning stages of all colds.
4. Keep your child away from other children who have colds.

### Constipation

Constipation is the infrequent or difficult evacuation of the bowels. It is a common disorder.

Some of its common causes are:

1. A sedentary life with its lack of muscle activity and a resulting lack of muscle tone.
2. A neglecting of nature's impulse because of other things which at the time seem more important.
3. Food faults such as:
  - A. Eating too rapidly.
  - B. Chewing insufficiently.
  - C. Insufficient liquid in the diet.
  - D. Over indulgence in foods.
  - E. Not enough bulky foods, such as fruits and top of the ground vegetables.

Parents should recognize the early evidences of constipation in children. These evidences manifest themselves as headaches, dizziness, mental sluggishness, lassitude, at times a fetor of the breath and a coated tongue, as well as small difficult bowel movements.

Children should be encouraged to play regularly out of

doors. They should be taught and trained to eat generously of vegetables and fruits and sparingly of meats and deserts.

Parents should make the meal hour and the period immediately following a time for cheerful conversation. They should remember that fear, worry, anger and similar emotions interfere with normal digestion, and so indirectly lead to constipation.

The stool height should be so arranged that the child's feet are supported, thereby making it possible for the abdominal muscles to work advantageously.

Any child who must use cathartics regularly should be taken to the family physician for examination and advice.

### Underweight

Pupils who are distinctly underweight for their age and height, work under a severe handicap. They are, as a rule, victims of fatigue. They lack interest in their work, and are usually indifferent to all play and game appeals. They are more susceptible to sickness and disease conditions than their more fortunate companions. It is admitted that there are many seeming exceptions to the above mentioned generalizations; but even the so-called "exceptional cases" show a nerve instability that is not normal.

The judgment of physicians and health workers in general, holds that a child who is up to weight for his age and height has an advantage in physical and mental vigor over his classmate who is materially underweight.

### CAUSES OF UNDERWEIGHT

1. Heredity is an important determining factor in the problem of body weight.
2. Unrecognized or untreated physical defects such as enlarged or diseased tonsils and adenoids. (These are directly related to malnutrition both because they obstruct the air and food passages and because disease

conditions of all kinds lower the efficiency of proper digestion and the assimilation of food materials.)

3. Poor food habits and improper food choices.

- A. Eating irregularly.
- B. Eating too rapidly.
- C. Eating when physically or mentally tired.
- D. Eating candy and other sweets between meals thereby interfering with the normal desire for and digestion of essential foods.
- E. Overindulgence in coffee, tea, and other stimulants that are not conducive to the normal functioning of the digestive apparatus.

4. Insufficient daily exercise out of doors.

The parents can help combat the problem of underweight. They should:

- 1. Insist that all physical defects be corrected.
- 2. Have the children eat regularly, slowly, and of the proper foods. Milk is a perfect food and it should form an important part in the diet of every child.
- 3. Be careful to have the bowel action of the children regular and satisfactory.
- 4. Keep the home and particularly the bedrooms well aired and ventilated.
- 5. Be sure that the children's play is with good companions, pleasing to the child, and not carried to the point of exhaustion.
- 6. See that the children's teeth are examined regularly, treated for defects, and cared for rigorously.
- 7. Impress upon the children that Nature is not interested in any promise made that you will rest up sometime later on. She wants her children to be healthy, happy, and successful. She does not want children or adults to overdo. Therefore, rest periods should follow strenuous effort periods.

8. Always remember that sleep is one of Nature's greatest blessings. No program should be encouraged or condoned that deprives children of their rest and sleep.
9. Encourage the children to spend hours out of doors every day.
10. Develop a "Be examined by a competent physician at least once a year" habit.

### Overweight

1. "As the parent so is the child" is a philosophy that has given much comfort to lazy, indulgent young people who view the increase of their body weight as something over which they have no control.

2. Overweight in a young person is not a serious handicap but if it is a forerunner of that condition in middle life, we should strive to correct it, for excess weight between the ages of 45 and 60 is decidedly dangerous.

### CAUSES

1. Heredity is an important determining factor in the problem of weight in general.
2. Overindulgence in fat-producing foods such as candy, sweets, under the ground vegetables, particularly potatoes, fruits, such as grapes and bananas, and all white breads.
3. Physical laziness.
4. A pampering of self with excuses and subterfuges in lieu of actual participation in the physical activities that burn up tissue body.

Parents should know that:

1. The science of medicine teaches us that the treatment of overweight must be based on exercise and diet.
2. Exercise should be prescribed for individual needs and should then be taken regularly and energetically.
3. No general diet is suitable for all cases of overweight,



but in general, the person who wishes to reduce should eliminate candy, pastry, potatoes, butter, grapes, and bananas from the diet.

4. Dieting does not mean starving or privation. It means proper selection of foods and an ability to practice the doctrine of "Eat to live and not live to eat."

### **The Child Health Association**

#### **POSITIVE HEALTH ESSENTIALS**

1. A full bath more than once a week.
2. Brushing the teeth at least once a day.
3. Sleeping long hours with windows open.
4. Drinking as much milk as possible, but not tea or coffee.
5. Eating some vegetable or fruit every day.
6. Drinking at least four glasses of water a day.
7. Playing part of every day out of doors.
8. A bowel movement every morning.
9. Washing the hands before eating and after going to the toilet.
10. Always carrying a handkerchief and being careful to protect other people by holding it over your mouth and nose and lowering the head when coughing or sneezing.

## K

### LIST OF HEALTH ORGANIZATIONS<sup>1</sup>

1. American Child Health Association, 370 Seventh Avenue, New York City.

A complete list of publications may be secured by writing to the Association.

2. Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association. Washington, D. C.: National Education Association.

#### Reports:

"Minimum Health Requirements for Rural Schools", 1920, 8p. 10c.

"Health Essentials for Rural School Children", 1921, 24p. 15c.

"Health Chart Report" (illustrated), 1928, 64p. 25c.

"Health Improvement in Rural Schools", 1922, 52p. 25c.

"Health Service in City Schools", 1922, 40p. 25c.

"Health Education—A Program for Public Schools and Teacher Training Institutions," revised edition, 1930, 251p. Cloth, \$1.75; paper, \$1.25.

"Ventilation of School Buildings", 1925, 8p. 15c.

"Daylight in the Schoolroom", 1921, 8p. 5c.

"The Teacher's Part in Social Hygiene", 1926, 20p. gratis.

#### Charts:

Sixty "Exhibit Charts" illustrating health problems in education. Size, 22 x 28. Prices: single charts 50c; any 5 charts \$2.25; any 10 charts \$4.00; 25 charts or more 35c each; 50 charts or more 30c each.

<sup>1</sup> With acknowledgments to Report of the Joint Committee, N. E. A. and A. M. A., 1930.

3. National Tuberculosis Association, 370 Seventh Avenue, New York City.

List of publications; health plays, posters, pamphlets, etc. "Health Teaching in Schools, A Manual for Teachers."

4. Office of Education, Department of Interior, Washington, D. C.

Health Education Series:

- No. 1. Wanted, Teachers to Enlist for Child Health Service.
- No. 2. Diet for the School Child.
- No. 3. Summer Health and Play School.
- No. 4. Teaching Health.
- No. 5. Child Health Program for Parent-Teacher Associations and Women's Clubs.
- No. 6. Further Steps in Teaching Health.
- No. 7. The Lunch Hour at School.
- No. 8. Health Training for Teachers.
- No. 9. Your Opportunity in the Schools.
- No. 10. Suggestions for a Program of Health Teaching in Elementary Schools.
- No. 11. Milk and Our School Children.
- No. 12. Sleep.
- No. 13. Dramatics for Health Teaching.
- No. 14. The Kindergarten and Health.
- No. 15. Suggestions for a Program for Health Teaching in the High School.
- No. 16. The Continuing Need for Teachers of Child Health.
- No. 17. Helps for the Rural School Nurse.
- No. 18. What Every Teacher Should Know About the Physical Condition of Her Pupils.
- No. 19. Is Your Child Ready for School?
- No. 20. Better Teeth.

Nos. 10, 17, 19, and 20 are 10c; the others are 5c each.

School Health Studies:

- No. 1. Health for the School Children. A report

of the Advisory Committee of the National Child Health Council.

No. 2. The Child Health School in the School of Education of the University of Chicago.

No. 3. Who's Who in Healthland. A report on methods used to stimulate the acquisition of health habits in the schools of Newton, Mass.

No. 4. Growing Healthy Children. A study of health supervision in the Trenton, N. J., schools.

No. 5. Health Promotion in a Continuation School. Study of the Health teaching in the Girl's Continuation School, Fall River, Mass.

No. 6. Municipal School Playgrounds and Their Management.

No. 7. Recognition of Health as an Objective. Report of Conference at Boston, Oct. 1923.

No. 8. School Health Supervision. Report of Conference at Detroit, October, 1923.

No. 9. The Training of Dental Hygienists.

No. 10. Progress and Prospect in School Health Work.

No. 11. School Nurse Administration.

No. 12. The Health of the Teacher.

No. 13. The Hard-of-Hearing Child.

No. 14. Ten Steps in the Promotion of Health in Rural Schools.

No. 15. Physical Defects of School Children.

Nos. 1, 2, 3, 12 are 10c each; others, 5c each.

5. Other organizations from which Health Education Materials may be obtained

American Medical Association, 535 North Dearborn Street, Chicago, Ill.

American Posture League, 1 Madison Avenue, New York City.

American Red Cross, Washington, D. C.

- American Public Health Association, 450 Seventh Ave., New York City.
- American Social Hygiene Association, 370 Seventh Avenue, New York City.
- Association for the Prevention and Relief of Heart Diseases, 370 Seventh Avenue, New York City.
- Boy Scouts of America, 200 Fifth Avenue, New York City.
- Camp Fire Girls, 527 Fifth Avenue, New York City.
- Child Study Association of America, Inc., 54 West 74th Street, New York City.
- Children's Bureau, U. S. Department of Labor, Washington, D. C.
- Commonwealth Fund, 578 Madison Avenue, New York City.
- Elizabeth McCormick Memorial Fund, 848 North Dearborn St., Chicago, Ill.
- Life Extension Institute, 25 West 45th Street, New York City.
- Metropolitan Life Insurance Company, 1 Madison Avenue, New York City.
- National Child Welfare Association, 70 Fifth Avenue, New York City.
- National Committee for Mental Hygiene, 370 Seventh Avenue, New York City.
- National Congress of Parents and Teachers, 1201 Sixteenth St., Washington, D. C.
- National Health Council, 370 Seventh Avenue, New York City.
- National Organization for Public Health Nursing, 370 Seventh Avenue, New York City.
- National Safety Council, 168 North Michigan Avenue, Chicago, Ill.
- National Society for the Prevention of Blindness, 370 Seventh Avenue, New York City.
- National Woman's Christian Temperance Union, Evanston, Ill.
- Natural History Museum, New York City. Exhibits and slides.

Playground and Recreation Association of America,  
315 Fourth Avenue, New York City.

The Rockefeller Foundation, 61 Broadway, New York  
City.

The Russell Sage Foundation, 130 East 22nd Street,  
New York City.

Scientific Temperance Federation, 400 Boylston  
Street, Boston, Mass.

Society for the Study and Control of Cancer, 370  
Seventh Avenue, New York City.

State Boards of Health.

State Tuberculosis Associations.

Superintendent of Documents, Washington, D. C.  
Price list of government publications on health.

United States Department of Agriculture, Washing-  
ton, D. C.

United States Public Health Service, Washington,  
D. C.

Women's Foundation for Health, 370 Seventh Ave-  
nue, New York City.

Women's Press, 600 Lexington Avenue, New York  
City.

6. Films suitable for health education. A list of films may be secured from the National Health Council, 370 Seventh Avenue, New York City. This list, prepared in 1928, contains a classified list of health films organized according to subject matter, a list of local distributors by states, and a list of national distributors. Several hundred films are listed. The list is free.

7. Magazines containing health information:

1. *American Journal of Public Health and The Nation's Health*. American Public Health Association, 370 Seventh Avenue, New York City.
2. *Child Health Bulletin*. The American Child Health Association, 370 Seventh Avenue, New York City.



3. *Child Study Magazine*. Child Study Association of America, 54 West 74th St., New York City.
4. *Child Welfare*. The National Parent-Teacher Magazine. Subscription Offices: 5517 Germantown Ave., Philadelphia, Pa.
5. *Hygeia*. American Medical Association, 535 North Dearborn St., Chicago, Illinois.
6. *Journal of Health and Physical Education*. American Physical Education Association, P. O. Box 362, Ann Arbor, Michigan.
7. *Journal of the Outdoor Life*. National Tuberculosis Association, 370 Seventh Avenue, New York City.
8. *Library Index*. National Health Library, 370 Seventh Avenue, New York City.  
Issued weekly. Gives classified references to articles about health in many current journals.
9. *Nature Magazine*. American Nature Association, 1214 16th Street, N. W., Washington, D. C.
10. *Parents' Magazine*. The Parents' Publishing Association, Inc., 255 Fourth Avenue, New York City.
11. *Public Health Nurse*. National Organization for Public Health Nursing, Inc., 370 Seventh Avenue, New York City.

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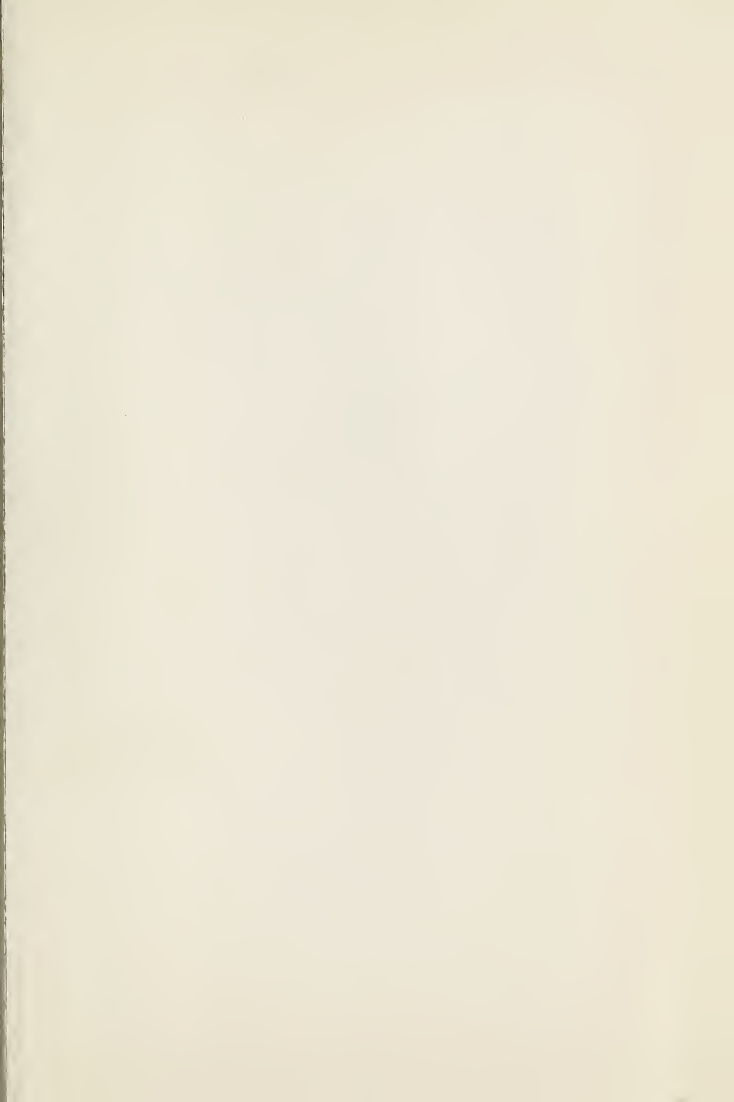
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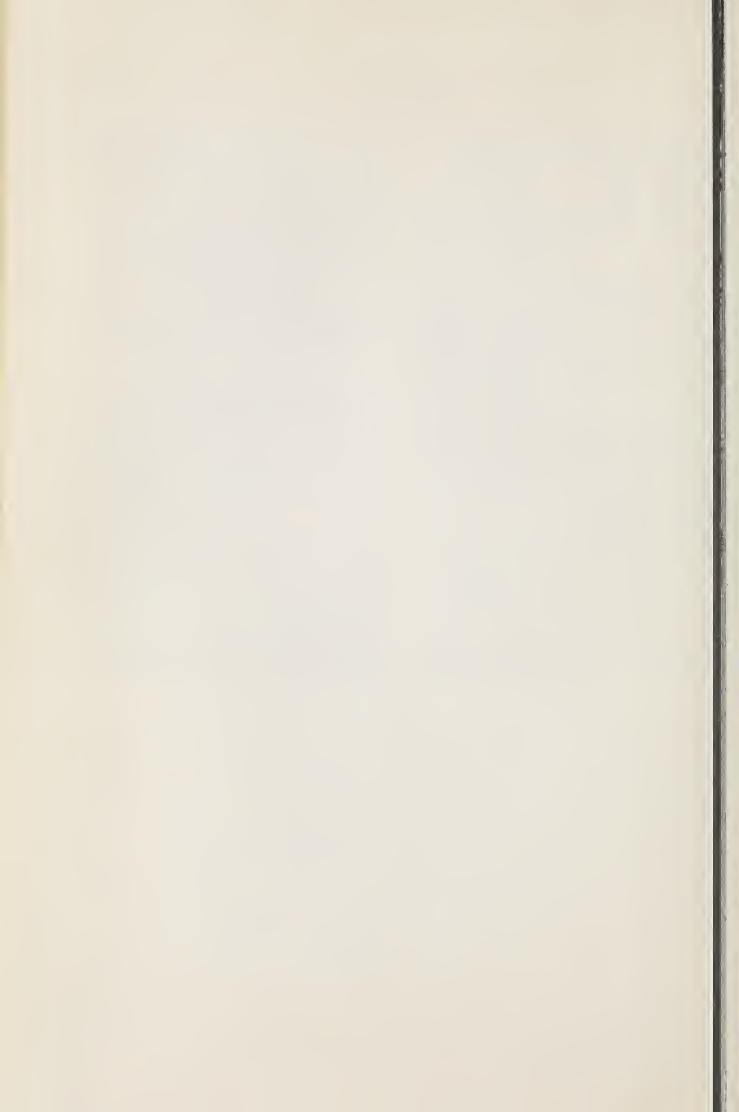
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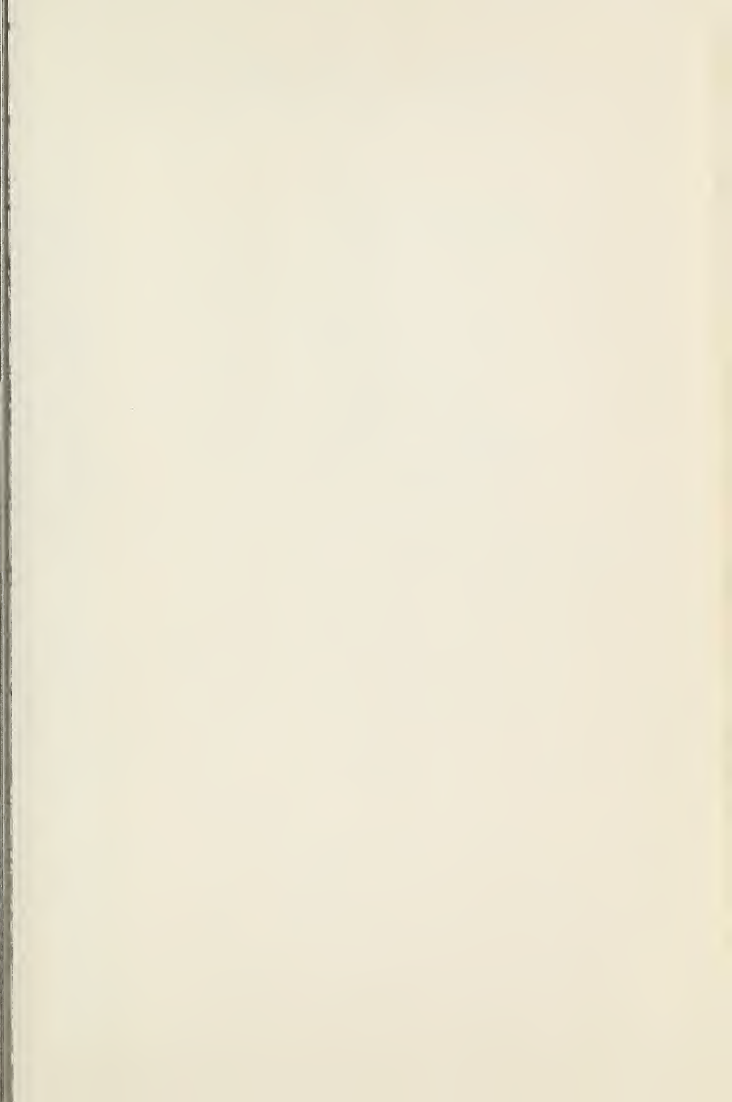


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